THE ENGINEERING AND MINING JOURNAL AND COAL

(Published Every Saturday at 253 Broadway, New York.
Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LXVIII. DECEMBER 30. No. 27.

RICHARD P ROTHWELL, C. E. M. E., Editor.
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THE SCIENTIFIC PUBLISHING CO., Publishers.

Subscriptions are PAYABLE IN ADVANCE For the United States, Mexico and Canada, $5 per annum: all other countries in the Postal Union, $7.
REMITTANCES should be made by bank drafts, post office orders or express money orders on New York, payable to the Scientific Publishing Co.
When change of address is desired, both old and new address should be sent.
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Main Office: 253 Broadway (P. O. Box 1833), NEW YORK.

Telephone Number, 3,095 Cortlandt.

New York Cable Address—"ROTHWELL." (Use McNeill's or A B C 4th Edition Code.)
London Cable Address—"PULCINETTO." " " " "

Branch Offices: **Chicago, Ill., 737 Monadnock Building, Phone 73 Harrison.**
Denver, Colo., Boston Building, Room 206.
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English subscriptions to the JOURNAL may be paid at the London office at the rate of $7 = £1 8s 9d.; the publications of the Scientific Publishing Company may be bought at the rate of 4s. 2d. to the dollar net.

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The "Engineering and Mining Journal" presents the compliments of the season to its readers, and wishes them all prosperity and happiness in the last year of the century. Never before were the industries represented by the "Engineering and Mining Journal" so prosperous, and never had so bright an outlook for the future. The fact that the United States can produce nearly every commercial mineral and metal at a less cost than they are produced in any other country has already opened many foreign markets, and as our production increases we shall become the chief source of supply for the greater part of the civilized world. This encouraging prospect should set the whole world to thinking. It has already created a demand in nearly every country for our technical skill and mechanical appliances, and has enabled us to command many foreign markets.

The Pittsburg Reduction Company, referring to the statement of our Utah special correspondent ("Engineering and Mining Journal," November 11th, p. 589) that "the Telluride Electric Power Company had abandoned its scheme of using aluminum wire conductors from its Provo Cañon works to Mercur," informs us that the company has not abandoned the use of aluminum conductors, but it replaced a defective lot of aluminum by new aluminum wire. The manager of the power company, Mr. L. L. Nunn, writes that it has ordered 250 miles of aluminum conductor, and is endeavoring to contract for 600 miles more. Evidently the company has found aluminum conductors advantageous.

The statistics of mineral and metal production in the United States in the calendar year just closing have been collected, as usual, by the "Engineering and Mining Journal" and will be published in this paper next week. These statistics cover 11 metals and 32 minerals. They also give the output of important metals in Canada and Mexico during the current year.

The world's production of gold and silver has been collected with much care and these statistics will prove an extremely valuable guide for the financial world. These are indeed the only statistics actually collected that are available at this early date. The mineral production of the United States in 1899 has been far greater than ever before and as unit values have also been much higher than for some years past, the aggregate value of our output will make startling figures. Great pains have been taken to get the fullest possible returns from producers, and these efforts have been responded to with the utmost courtesy by all classes applied to.

With hostilities in the Transvaal almost at a standstill, and both sides strengthening their positions, it is becoming pretty clear that the war is going to last considerably longer than was expected, and the probabilities are that it will be some months before the gold mines of the Rand are working again. There has been considerable speculation as to the actual amount of damage that the mines will suffer by a prolonged period of idleness, or by acts of violence at the hands of the resident population, and some of these conjectures have had altogether too little foundation. Concerning acts of violence, it is, of course, impossible to say what desperate men at bay may do in their last resource, but it is to be remembered that peace may come before Johannesburg has been invested by an invading army, and consequently, without causing wild outbreaks of hatred on the part of the inhabitants. The mere suspension of work at the mines is not likely to cause very much damage. The mines are quite dry, and will be a long time filling with water. Even if they are flooded, it must be remembered that the banket formation of the Rand is extremely hard, and that timber is used as little as possible, owing to its high price. Were any of the mines located in such wet and heavy ground as the Comstock Lode, a suspension of work might be an extremely serious matter; but speaking broadly, the Transvaal mines might lie full of water for a year or so, without much harm.

Regarding the present output of the mines, it is very difficult to make an accurate estimate. A newspaper report gives the October output as 63,000 oz. This looks like a rather high figure, taking into consideration the general exodus of native laborers and skilled mill men and foreign engineers from Johannesburg. Still, it is probable that a considerable number of cyanide plants might be kept running even though underground work ceased entirely; and the cyanide product is normally about 35 per cent. of the total output. The cyanide plants will furnish almost all the gold produced so long as the war is on, for the milling plants are probably more or less crippled by intentional alterations made by the departing mill men—yet these surface works are likely to suffer most from acts of violence. Consequently it is likely that while the output of gold will be a small fraction of the normal, production will not stop entirely for some time yet.

THE CALHOUN-AJAX CASE.—THE RIGHTS OF TUNNELS AND OF LOCATIONS ON CROSS VEINS.

A recent decision of the Supreme Court of Colorado, though subject, of course, to review by higher authority, seems, by reason of the importance of its subject, and the weight of its reasoning, to deserve special attention as a new and valuable exposition of the United States mining law. I refer to the case of the Calhoun versus the Ajax Gold Mining Company, appealed from the District Court of El Paso County, Colorado (which had given judgment against the Calhoun Company), and decided on appeal, November 21st, 1899, by the Colorado Supreme Court.

Like almost all such cases, this one involved a number of issues and pleadings of merely local significance, or involving only questions of legal practice. I shall, in stating it, eliminate these, as far as possible, so as to bring out the questions which do not turn upon local conditions, State legislation or rules of procedure, but involve the construction of the Federal statute. The full text of the decision will, I think, not be requisite to the understanding of this review of it.

The essential facts appear to be:

1. The Calhoun was owner of a lode-location, crossing obliquely several locations belonging to the Ajax, and of a tunnel-location also crossing them.

2. The Ajax was owner of several lode-locations, all originally made, and subsequently perfected (by the issuance, either of the Receivers' receipt or of the United States patent), before the location of the lode or the tunnel of the Calhoun.

3. In the court below the Ajax had sought to recover damages for ore extracted by the Calhoun, from beneath the surface of the Ajax locations, and also to have the Calhoun enjoined from any further such extraction of ore, and from extending its tunnel under the said surface.

4. The Calhoun had pleaded, as a defence, in that court, that it possessed the right to extract the said ore, because the ore belonged to its located lode, which crossed obliquely, in its strike, the locations of the Ajax, and was, as regarded the lodes of those locations, a cross-lode; and, further, that it possessed the right, by virtue of its tunnel-location, to continue its tunnel under the surface of the Ajax locations, and to appropriate such "blind" lodes as might be discovered in the said tunnel, as well as to cut and work, by means of said tunnel, its own located "cross-lode," notwithstanding the ownership of the surface by the Ajax, through its prior locations.

5. The court below gave judgment on all points in favor of the Ajax, granting damages for the ore extracted, and an injunction, restraining the Calhoun "from prosecuting work upon, or extending its tunnel underneath," the locations of the Ajax, and "from further taking out, extracting or removing ore, by means of said tunnel or otherwise, from within the side lines" of the said locations, "extended downward vertically."

6. From this judgment the Calhoun appealed; and, by stipulation of the parties, the following four questions were submitted for the decision of the Appellate Court:

A. Whether, under the circumstances, the Calhoun's tunnel was entitled to a right of way through the ground covered by the Ajax locations.

B. Whether the Calhoun had acquired, by virtue of its tunnel-location, the right to blind lodes; that is, lodes not appearing on the surface, and not known to exist prior to the location of the tunnel.

C. Whether the Calhoun, was entitled to ore contained in its cross-lode, and lying beneath the surface included within the Ajax locations.

D. Whether the Calhoun might, in the trial of this case, properly introduce evidence to show that, on certain of the locations of the Ajax, there had been, prior to the location of the Calhoun's tunnel, no discovery of mineral in place—in other words, that the Ajax title to said claims was, at the date of the tunnel-location, not valid.

The decision of the Appellate Court confirmed at all points the judgment of the court below, and was against the Calhoun on the four questions above stated. In considering it, I will first mention and dismiss the last of these four questions, the treatment of which by the court was obviously in the line of many precedents, as well as of sound reasoning. At the date of the tunnel-location, the Ajax locations, now alleged to have lacked the necessary discovery of mineral in place, had passed through all the necessary steps of survey, advertisement, payment, etc., and had been practically perfected by patent, though, apparently, the patents had not actually issued. But at the time of the trial this step also had been completed, and it was very properly held that a collateral attack upon the Ajax title, thus evidenced, was not permissible.

In considering the three other questions submitted to it, the court reduced them to two, namely:

A. Is the Calhoun entitled to the ore in its cross-lode, which lies under the Ajax system?

B. Is the Calhoun entitled to blind veins cut by its tunnel, and to the right of way for the said tunnel, under the said surface?

I will consider the decision of these questions in their order.

A. The claim of the Calhoun in this respect was based upon Section 2336 of the Revised Statutes, which reads as follows:

"Sec. 2336.—When two or more veins intersect each other, priority of title shall govern, and such prior location shall be entitled to all ore or mineral contained within the space of intersection; but the subsequent location shall have the right of way through the space of intersection for the purposes of the convenient working of the mine. And when two or more veins unite, the oldest or prior location shall take the vein below the point of union, including all the space of intersection."

The construction of this provision, both by courts and by writers on the subject, has been, in some instances, almost ludicrous. Thus, the excellent treatise of Barringer and Adams* says that "cross-lodes are of course those which intersect on the strike," thus missing altogether the true bearing of the section, and proceeds to discuss, as the main question involved, the proper definition of "the space of intersection"—a matter so simple and obvious as scarcely to require elucidation. The really important point is, that Section 2336 refers, not at all to intersections on the strike, but only to intersections on the dip; that is, to those intersections which involve the otherwise equally valid apex-rights of two parties. In other words, if two locators, occupying equally valid locations upon the surface, should find their lodes to cross or unite, at a point to which each has arrived by the legitimate pursuance of his lode from the apex within his claim, this section prescribes that priority of location shall determine their relative rights. Before the enactment of this section, such a conflict was liable to be determined by "geological" evidence—that is to say, by the opinions of experts as to which of the two lodes thus crossing or uniting was the more important geologically, which was the earlier and which the later in formation, or which was the "main lode," and which a mere "branch" or "spur." It was the purpose of Section 2336 to substitute for such scientific subtleties a simple test, easily applied—namely, that of priority of location. This was a reasonable and adequate purpose; and that it concerned exclusively the intersection or union of lodes on the dip, not on the strike, is clear enough from the fact that intersections on the strike were already provided for in Section 2322, which gives to each prior locator the right to lodes apexing within his location. A lode intersecting his lode on the strike would necessarily have part of its apex in his ground; and this condition of affairs would be covered by Section 2322.

In the majority of instances, both of intersection and of union, the planes of the two veins are relatively oblique; that is, the intersection is on both dip and strike. But the principle above laid down can be applied without difficulty. Whoever owns that portion of the apex legally covering the ground in dispute, owns the ground and the ore in it.

The wholly unnecessary assumption that Section 2336 applies to intersections on the strike, led to the surprising opinion of Judge Hallett, delivered in the United States Circuit Court, in a proceeding connected with the case of Hall versus Equator Company.† It does not appear from the record that this opinion was required by the immediate issue before the court. In fact, after deciding that issue by relegating the parties to the trial before a jury, the court introduced its further opinion by saying that "some general remarks in addition, as to the proper construction of the Act of Congress, may assist the parties in that investigation." The assistance thus kindly offered in advance was based on the hypothesis that the future trial might show the existence in the disputed ground of two lodes, crossing each other on the strike. As all who remember the famous Equator case are aware, the trial showed no such state of affairs. It turned out to be a leading case on the very different question of the "divided apex." The court's general remarks had therefore no application at all, and it is quite conceivable that, in a case really involving the subject, the court, after hearing arguments pro and con, might not have made such remarks. Yet this obiter dictum has done so much mischief in Colorado as to deserve quotation here:

"The general language of Section 2322 seems to comprehend all lodes having their tops and apices in the territory described in the patent, whether the same lie transversely or collaterally to the principal lode on which the location was made.

"Considered by itself, such would be the meaning and effect of that section. But there is another section relating to cross lodes, which is of different import. It was numbered 14 in the original act of 1872, Section 2336, Revised Statutes, second edition, and is as follows: . . .

[Then follows the text of Section 2336.]

"It will be observed that by this section the first locator and patentee of a lode gets only such part of cross and intersecting veins as lie within the space of intersection, to the exclusion of the remainder of such lodes and veins lying within his own territory. So far, this section is in conflict with Section 2322, before mentioned, and the matter of precedence between them is settled by an arbitrary rule established long ago. As between conflicting statutes the latest in date will prevail, so

*"The Law of Mines and Mining in the United States." Boston, Little, Brown & Co., 1897, page 472.

†"Federal Cases," No. 5,931; "Morrison's Mining Rights," third edition, page 282; also "Lindley on Mines," Section 558.

between conflicting sections of the same statute the last in the order of arrangement will control.

"The presumption that one section of a statute was adopted before another seems to be very slight, and perhaps this rule has no other merit than to afford the means of solving a difficult question. But the rule appears to be well established and to be applicable to the present case. It gives to Section 2336, Revised Statutes, or Section 14, as it stood in the original act, a controlling effect over the prior section, and limits the right of the first locator of a mine in and to cross and intersecting veins to the ore which may be found in the space of intersection. If there are, in fact, two lodes crossing each other in these locations, the plaintiffs, having the elder title by patent, have the better right, but it is limited as last stated."

This opinion was followed as a precedent by the Supreme Court of Colorado in numerous cases, of which Branagan versus Dulaney (8 Colo., 408) was especially relied upon in the case here under review.

Meanwhile, the courts of other States had repudiated the doctrine. Thus, the Supreme Court of Arizona, in Watervale Mining Company versus Leach (33 Pacific Rep., 418), said:

"The construction urged and supported by the Equator and subsequent Colorado decisions violates the language of the statute, injects into it things not there, results in conflict in the statute among its parts, and makes infinitely more complex the old system of lode claims. . . . Section 2322 gives, not the lode alone, but all lodes, veins, and ledges throughout their entire depth, the top or apex of which lies inside of the surface lines of the claim extended downward vertically; and as lodes may dip so that, when followed, they may be found to extend beyond the boundaries of the claim, Congress further provides that they may nevertheless be followed. In other words, Congress has said to the miners, 'Comply with the requirements that we impose, and the Government of the United States will grant absolutely to you a piece of the earth bounded at the surface by straight lines, distinctly marked, and by planes extending through those lines to the center of the earth; and you shall have all lodes of mineral-bearing rock whose apex is within these boundaries.' This is simple, plain, and the miners' rights are thereunder easy of ascertainment."

The same question arose in Montana, in Pardu versus Murray (4 Mont., 234), where the court said that the owner of a subsequent location, if his veins crossed a prior location, would be entitled only to a right of way, etc. It may be questioned whether he is, without any due legal proceedings in condemnation, entitled to even as much as that.

In California, the Supreme Court of that State, speaking of the "Colorado rule," said, in Wilhelm vs. Silvester (101 Cal., 358), that it "would leave the rights of location in the greatest confusion," etc. From these and other judicial decisions, Mr. Curtis Lindley ("Lindley on Mines," Section 560) has very properly inferred the true doctrine to be, that a subsequent locator has no right to invade the territory covered by a senior valid subsisting location, except in the lawful pursuit, on its downward course, of a vein, the apex of which is properly embraced within the junior location.

Thus, there have been, on this question of the rights of junior locators upon "cross-lodes," two rules, known respectively as the "Colorado" and the "Arizona-California" rules, of which the latter is by far the more reasonable, and, outside of Colorado, has received general acceptance. In the Colorado case here under review, the court has had the moral courage to abandon the "Colorado rule," and to bring the construction of the law in that State into line with both common sense and general usage. It is not necessary here to quote in detail the reasoning by which this decision was reached. In essential particulars, it agrees with that which has been followed by the courts of other States. The peculiar interest of this decision resides in the grounds which it adduces, to justify the reversal of the "Colorado rule." These are: (1) That that rule has wrought much confusion and litigation in Colorado; (2) that its correctness has been notoriously questioned by eminent mining lawyers in the State; (3) that a decision of the Colorado Supreme Court (in Argonaut Company versus Turner, 23 Colorado, 466) had already given warning of a doubt concerning the rights of cross-lodes, so that the "Colorado rule" could not be held as settled beyond reversal, and (4) that the matter will have to be finally decided by the United States Supreme Court anyhow. I understand the last two reasons to be adduced as answering the plea of "stare decisis," according to which it is best that a decision, even though erroneous, should be adhered to, if it has been for a long time accepted and acted upon as the law; and that the substance of the court's reply is, that this particular "Colorado rule" has never been fully accepted; and that the prevalent doubt as to its correctness, the contradiction of it by courts of equal authority outside of Colorado and the absence, hitherto, of a final adjudication of these conflicting views by the United States Supreme Court, operate, on one hand, as a sufficient caution against its acceptance as final, while, on the other hand, they justify a revision and reversal of it, even by the courts of the State in which it originated.

Curiously enough, after having thus justified its disregard of a rule originating with Judge Hallett, the court included among other grounds of its contrary decision, a very clear, pertinent and conclusive declaration of the same judge, in the case of Stratton versus Gold Sovereign Mining and Tunnel Company (Mills' "Legal Adviser," 350), in which he said:

"Chapter 6 of the Revised Statutes provides for three kinds of locations on the public lands, which, in common speech, are called 'lode-locations.' 'tunnel-locations' and 'placer-locations.' When a location has been properly made in either class, and so long as it shall be fully maintained by use and enjoyment or by patent, the territory embraced in such location is not subject to adverse location by a claimant of the same class, or any other class. The reason is that the territory covered by such location has been severed from the public domain, and has become private property, which is no longer open to a new appropriation."

It is, perhaps, possible to reconcile this excellent exposition of the law with the "obiter dictum" in the Equator case, proceeding from the same authority, but I think the general statement just quoted had better be allowed to supersede the earlier one, according to the doctrine, invoked by the distinguished author of both, of the controlling effect of later utterances.

B. The claim of the Calhoun as to the first part of this question was, that in all patents for lode-claims, blind lodes are excepted, and that the patentee takes no title thereto by virtue of his patent. This proposition was more audacious than the case really required. It would have been equally sufficient, and more plausible, to maintain that the right of the patentee was made, by Section 2323 of Revised Statutes, subject to the tunnel-right, conferred by that section, while it might still be good against all other parties than the tunnel-owner. But the ruling of the Colorado Supreme Court in this case covers both propositions.

Section 2323, Revised Statutes, reads as follows:

"Where a tunnel is run for the development of a vein or lode, or for the discovery of mines, the owners of such tunnel shall have the right of possession of all veins or lodes within three thousand feet from the face of such tunnel on the line thereof, not previously known to exist, discovered in such tunnel, to the same extent as if discovered from the surface; and location on the line of such tunnel of veins or lodes not appearing at the surface, made by other parties after the commencement of the tunnel and while the same is being prosecuted with reasonable diligence, shall be invalid; but failure to prosecute the work on the tunnel for six months shall be considered as an abandonment of the right to all undiscovered veins on the line of such tunnel."

In an article on "Tunnel-Rights Under the United States Mining Law," published in Volume VI. of "The Mineral Industry," I discussed the meaning of this section, and the mischievous bearing of certain judicial decisions under it. In the summary concluding that article, I said (p. 688):

"The owners of lode-locations made before the location of any tunnel projected to underrun them may, I think, even under the extreme views recently announced by the [U. S.] Supreme Court, rest secure in their possessory or patent titles."

This opinion the decision here under review confirms.* It declares, first, that a valid location of a mining claim, so long as it is in full force and effect, operates as a bar to any second occupancy of the premises so claimed, leaving open to others only such rights as do not attach to the first-comer by virtue of his location. Then, proceeding to inquire what rights, if any, are thus excepted, it points out that if the right to blind lodes be one of them, then Section 2322 (granting to a locator the right to all lodes apexing within his location) and Section 2323 (defining the rights of tunnel-locations) would be hopelessly in conflict. Such an alleged conflict had been asserted already, as I have explained above, and the imagined difficulty had been solved by recourse to the extreme (and, with respect to this statute, whimsical and unnecessary) principle, that where two sections of a statute mutually conflict, the later in order must be deemed to be the later in origin, and to express the later intention of the Legislature, and therefore to supersede the previous section. But the court takes, in this case, a more sensible view. It falls back upon the common law of mining, so to speak, and reasserts the right of priority—not in the order of the printed provisions of the statute, but in the actual appropriation of the public domain under the statute. In other words, it will not impose upon Section 2323 a construction which would supersede the general, fundamental grant of Section 2322.

Under question B, the court goes still further, and rules that the later tunnel-location has not even a right of way through the ground of a

*On the following page of the article cited I expressed another opinion, which I take this opportunity to retract—to a certain extent. Namely, I said that a lode location, though made after the tunnel location, if properly made on a lode appearing at the surface, and not yet discovered in the tunnel, would secure not only the ownership of the "located" lode, but also that of all other lodes, blind or otherwise, apexing within the located ground. I said that this opinion seemed to contradict the sweeping dictum of the United States Supreme Court in the Rico-Aspen case (Enterprise versus Rico-Aspen, 167 U. S., 108), but that I did not think this precise situation was clearly before the court in that case, and that, at all events, I thought it still presented "a good fighting chance." After the appearance of that article I received from an eminent mining lawyer of Colorado a letter, in which the first of these assertions was questioned; and upon examination of the full report of the Rico-Aspen case, I was obliged to confess that the precise question referred to was before the court in that case, and was decided contrary to my view. The fighting chance to which I then referred is, therefore, narrowed to the rather slender chance that the U. S. Supreme Court may be induced to review and qualify a decision it has once made. Such a thing is not without precedent; and, moreover, there is a pretty general feeling among students, practitioners and authorities in U. S. mining law that our Supreme Court will have to take back something, sooner or later, in view of the collateral effects of certain of its too sweeping utterances. But it must be frankly confessed that such reversals are, on general principles, not desirable, and that the longer the original erroneous judgments have stood as part of the acknowledged law, the less likely and the less salutary will be any change of them. I am afraid, therefore, that my opinion, in this instance, must fall back into the place of a purely academic statement—representing what is not—though I may still persist in believing that it ought to be—the law.

prior, valid, subsisting surface-location. As I read the decision, it is, that the tunnel has no other right of way through such ground than it would have through any other private property. State legislation may provide for such a right of way, subject to the usual formalities and precautions attending the exercise of the State's eminent domain. In some instances, State Legislatures (notably that of New York) have treated the mining industry as a matter of public welfare to such an extent as to clothe it, even in private hands, with "eminent domain," and enable it, after due formal proceedings, to acquire by "condemnation" the easements (including the right of way) necessary to its prosecution. And Section 2338 of the United States Revised Statutes provides that State Legislatures may, in the absence of Federal laws, make such regulations, even as regards the public domain. But the first question in this case was, whether Section 2323 (the "tunnel-section") confers, per se, and without any further legal proceedings, a right of way through prior and valid lode-locations upon public mineral land. Subordinate to this arose the question whether any local legislation of Colorado has conferred such a right. Both these questions are answered in the negative. In the words of the admirable summary of the Court:

"Mining rights are statutory, but not purely so. They relate to real estate; and such rights as are not defined or limited by statute are still controlled by the rules of the common law. Such rights as are conferred by a valid, prior location, so long as it remains in full force and effect, are preserved from invasion . . . and are as fully protected under the rule of the common law as any other classes of real estate. Under the statute, the subsequent locator has no right to penetrate a senior, valid, subsisting location, except for the purposes specified in the mining laws. . . . Such exceptions do not include the right to drive a tunnel through such a location for the purpose of discovery. . . . Our construction of Section 2323 is that a tunnel-site can only embrace unappropriated public domain; and that, under it, no rights are conferred to extend a tunnel through previous, valid, subsisting locations."

As a whole, this decision, reaffirming and fortifying, as it does, the famous and fundamental doctrine of the completeness and invulnerability of the title conveyed by a patent of the United States, and the equally important doctrine of the rights of a valid, subsisting location on those public mineral lands to which the United States mining laws apply, is so highly sane and wholesome that we must earnestly hope for its confirmation by the United States Supreme Court, to which tribunal, it is said, this case will be carried for final adjudication.

R. W. R.

NEW PUBLICATIONS.

"Report on the Geology and Natural Resources of the area included by the Nipissing and Temiscaming Map-Sheets, comprising portions of the District of Nipissing, Ontario, and of the County of Pontiac, Quebec." By Alfred Ernest Barlow, Ottawa; Government Printer. 1899. Pages, 302. Price, 30 cents.

This report is one of the many excellent publications, issued of late years by the Geological Survey of Canada, and shows that the author has evidently done detailed work in the region which he was to examine. It is one of the unfortunate characteristics of some of the reports of the Canadian Survey, that they show a lack of close and thorough examination in the field. The only way that it is possible to get definite results, results of permanent value, in field geology, is to map accurately all rock exposures noted, and determine on the spot the direction and dip of foliation or stratification planes, and the relations between adjacent rock masses. Of course, in reconnoissance work details have to be slighted more or less, but it is these details that give value to general conclusions, and it is to be regretted that some Canadian geologists have apparently been satisfied to map in rock formations by guess work, from a birch-bark canoe.

The present volume does not contain as many sketches of rock contacts, etc., as it might, but is still an excellent report. Its value is chiefly theoretical, as the region studied adjoins on the southwest that studied by Sir Wm. Logan, Murray and others in 1856, containing the rocks to which the term Huronian was applied. The author finds in this area a fundamental granite-gneiss below the gray-wacke, conglomerates, quartzites and shales of the Huronian, and also states that the Huronian rocks are both of aqueous and igneous origin. The break between the fundamental granite-gneiss and Huronian, in places is apparently eruptive, and in other places a gradual transition. The Huronian, itself, apparently contains no marked unconformity, and its total thickness is about 1,800 ft. The area contains little of economic importance, though specimens of ore thought to contain gold and silver have been found from time to time, and there have been attempts to boom gold and silver properties. The values shown by analyses are very low, with the exception of one galena vein a New York company is working. Iron ores are scattered through the district, but no deposits of value are known.

BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book buyers give the retail price? These notices do not supersede review on another page of the Journal.

"New Zealand.—Papers and Reports Relating to Minerals and Mining." Wellington, N. Z., 1899; Government Printing Office. Pages, 393; with diagrams and illustrations.

"Bidrag till Sveriges Officiela Statistik. Handel. Kommerskollegii Underdaniga Berättelse for ar 1898." Stockholm, Sweden; Imperial Printing Office. Pages, 236.

LODE TIN MINING IN THE MALAY PENINSULA.*

By W. H. Derrick.

Descriptions of tin mining in the Malay Peninsula have usually referred to alluvial mining, and some notes on vein mining for this metal may be of interest. The only vein mine in the Peninsula is that owned by the Pahang Corporation, Limited, which holds in the district of Kuantan, in Pahang, one of the Federated Malay States, a concession estimated to contain over 100 square miles. Although tin, both lode and alluvial, has been found over the greater part of the concession, the payable lodes appear to lie in the comparatively small area of about 10 square miles. These lodes run approximately east and west, are from 50 to 2,000 ft. apart, range in thickness from 2 to 10 ft., and produce from 1 to 15 per cent. of tin oxide to the ton.

The lodes underlie both north and south, at angles ranging from 10° to 40° from the vertical; they have generally one well-defined wall, but seldom two. The geology of the district is similar to that of parts of Cornwall, the granite, the basement rock, being much the same and being also overlaid by varieties of clay schist, with the tin lodes running down right through the slate into the granite. A few isolated hills of calc-spar remain, although at one time this rock must have covered the slate, as the latter is everywhere seen intersected with veins of spar.

The principal metals found in the lodes are tin, copper, iron, and arsenical pyrites, blende and galena. Of these metals tin and copper only have been discovered in workable quantities; the latter usually carries from 25 to 30 oz. of silver to the ton, and appears to be quickly giving place in depth to tin.

The mines now being worked by the Pahang Corporation were, so report says, continuously worked by Malays and Chinese for more than 100 years, the large surface excavations made by them, some of which are 1,000 ft. long, 200 ft. wide and 150 ft. deep, testifying to this. The open-cast system was the only one adopted by the old miners, and as timber was seldom made use of to secure loose ground, the sides of their working were sloped or terraced to keep them from falling in. This, and not the thickness of the lodes, accounts in many instances for the great width of the old workings. Under native management (at least within recent years) the mines were not a financial success, owing apparently to want of capital, and, consequently, of proper machinery, as well as the native objection to doing anything in the shape of dead work, their mode of operation being to follow any payable ground from the surface down as far as they were able to, without steam pumps and timber.

Explosives of any description were never made use of, owing to a strange superstition firmly believed in by the Chinese that the use of explosives frightens away the metal in a mine. In consequence of this, any very hard ground could not be worked. The ore obtained was crushed by wooden stamps shod with iron and worked by small overshot and undershot water wheels. The only dressing appliance used was a long-tom, the tail losses from which were very heavy. These tails were assayed, and found to contain as much as 7 per cent. of tin oxide. They are principally composed of coarse grains of tin and quartz adhering together, and which only required finer crushing to allow the tin to be readily separated out.

For working the mines, the Pahang Corporation makes use of Chinese, Javanese, Malay, and Tamil labor, Europeans being employed for supervision work only. With the exception of ore dressing all work is let out on contract.

Stoping is paid for by the truck of 16 to 18 cwt., prices delivered at the battery ranging from 45c. to $1.50 per ton, according to the nature of the ground stoped and the distance of the mine from the battery, which in some cases is as much as two miles, the mines being all connected with the batteries by tramroads.

Contractors pay for all tools and materials, dynamite, fuse, detonators, candles, etc., and put in timber as required.

If the quality of the ore delivered at the battery drops below a certain percentage (which is fixed at the time of letting the contract), the contractor receives nothing for such ore. This insures the company against the delivery of waste. Each contractor's parcel of ore is stamped separately, and is constantly sampled and assayed as it passes through the mill.

Driving and sinking are let by the fathom, and prices range from $7.20 to $19.20 for drives, 7 ft. by 5 ft.; $10.20 to $26.40 for winzes, 6 ft. by 5 ft.; $24 to $144 for shafts, 12 ft. by 4 ft., these dimensions being all clear of timber.

Contractors, as in stoping, pay for all stores and put in timber as required, the timber of course being supplied free by the company. Drills are sharpened for contractors free. At one time this work was charged for, but it was found men wasted much time by using blunt tools rather than pay to have them re-sharpened.

The distances driven per month, by a gang of six men working in 8-hour shifts, vary from 10 to 40 ft. according to the nature of the ground. Shaft sinking ranges from 10 to 20 ft. per month in hard slate when 12 men are employed working 6-hour shifts.

The Chinese miner makes good progress in moderate and soft ground, but is usually a poor miner in really hard rock, and on this account he cannot compete with white labor. If time was the sole consideration in mining this might be so, but when expense also is taken into consideration it is far otherwise, a fact which is very apparent when one considers that white labor when employed on actual mining work is about ten times as expensive as native labor; in other words, a white man has to drive or sink 10 times the distance done by a native in order to compete with him, whereas in any but hard ground his progress would probably not much exceed that of an ordinary skilled Chinese miner.

The average cost of mining, including cost of drives and winzes (but not permanent shafts), timber, hauling and pumping charges and European supervision, is $1.20 per ton.

The Pahang Corporation has two batteries of 40 and 20 head of stamps respectively. The stamps are of the usual Californian type, weight 850

*Abstract of paper read before the Institution of Mining and Metallurgy, London.

lbs., and driven at a speed of 90 blows a minute, they crush about 2¼ tons per head per day. Vertical, high-pressure, non-condensing engines supply the motive power.

At present some 2,500 tons of tin stone are being treated per month for a yield of 85 to 95 tons of tin oxide—an average of about 3½ per cent. per ton. The ore is only crushed fine enough to pass through screens having 80 to 120 round burr holes to the square inch. Both copper and Swedish iron grates are used.

The dressing appliances first introduced were the usual concave and convex buddles from 12 ft. to 25 ft. in diameter, frames and tossing gear as seen on the dressing floors throughout Cornwall; but notwithstanding the cheap labor available for working these, they are gradually being replaced by more modern machinery and with the best of results.

Frue vanners with corrugated belts, size 4 ft. by 12 ft., are found to answer well in treating the ore as it comes direct from the stamps without classification. Working thus on ores carrying a large percentage of pyrites, the tables give heads (containing 25 to 45 per cent. of tin oxide) sufficiently clean to go direct to the calciner without further handling, and with tails ranging from 3 to 5 lbs. to the ton. Three tables are employed to treat the output from 10 stamps. The heads from the vanners are much cleaner than those obtained from the buddles, and the introduction of vanners has resulted in a reduction of at least 50 per cent. in the quantity of raw concentrates returned to the calciners, and, consequently, is a corresponding saving in roasting charges.

For calcining, the ordinary reverberatory furnace is used, and, with wood at $2.40 per cord (128 cu. ft.), cost of roasting, including labor, is $1 per ton of concentrates treated.

Tin-dressing coolies cost $4.32 per month. Native engine-drivers, carpenters, and blacksmiths, $9.60 to $14.40 per month. Europeans for supervision work, $96 to $144 per month. The total dressing cost, which includes stamping, European supervision, native labor, stores, and roasting charges is $1.32 per ton of stone crushed.

The standard to which the oxide is dressed always exceeds 70 per cent. of metal, the impurities being oxide of iron, a little silica, and from 0.0625 to 0.125 per cent. of copper. The total battery losses range from 5 to 8 lbs. to the ton.

Two pulverizers are employed grinding some 250 tons of coarse concentrates per month. One frue vanner is found sufficient for each pulverizer. Plain belt machines, belts 4 ft. by 12 ft., are found to give good results with the fine ore from the pulverizers, returning a very clean head and the tails, not exceeding 6 lbs. to the ton, when working on concentrates, running as high as 10 per cent. tin oxide to the ton.

A separate engine is employed for driving the vanners, and a high level tank is used for the water supply for same, thus ensuring a regular speed and steady flow of water—two very essential points in the successful working of frue vanners.

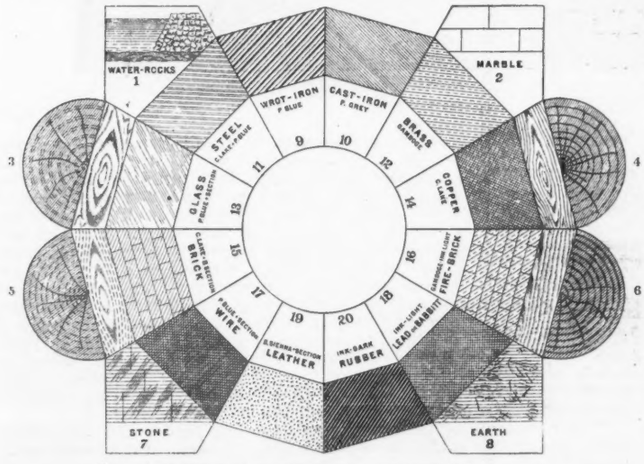
Jiggers of the 3-compartment type were tried at one of the mills, but did not give satisfactory results, and were consequently discarded.

When it is considered that lode tin mining in the Malay Peninsula is only as yet (under European management) in its infancy, it is but natural to expect that the next 10 years will show a marked increase in the present output of tin from this source. With the benefit of past experience future discoveries will doubtless be more rapidly developed and working expenses reduced to such an extent as to enable very low grade ores to be profitable treated; and in bringing about these results the numerous waterfalls and quick-running streams found all over the peninsula will, by providing cheap power, play an important part.

CONVENTIONAL SECTIONS FOR DRAWING.

Conventional section lines are placed on drawings to distinguish the different kinds of materials used when such drawings are to be finished in pencil, or traced for blue printing, or to be used for a reproduction of any kind.

The accompanying plate shows a collection of hatched lined sections



STANDARD SECTIONS FOR DRAFTSMEN.

that is now the almost universal practice among draftsmen in America and other countries, and may be considered standard. The diagram was prepared by Mr. John S. Reid, of the Sibley College of Engineering, Cornell University. It will be useful for reference to draftsmen everywhere.

In the diagram, No. 1 represents a section of rock, wall, and water. When used without color, as in tracings for blue printing, the rocks are simply shaded with India ink. For color drawing the groundwork is made of gamboge, or burnt umber, and the water is shown by a blended wash of Prussian blue. The convention for marble is shown in 2. To color this the whole section is made thoroughly wet, and each stone streaked with Payne's gray. Building stone in general may be shown as in 7, or colored with a light wash of Payne's gray, the shading lines being added with ruling and writing pens. For earth, India ink and neutral tint with India ink irregular-penned lines are used.

Chestnut is represented as in 3, to color which a ground wash of gamboge with a little crimson lake and burnt umber is used. The colors for graining should be mixed in a separate dish, and are burnt umber, Payne's gray and crimson lake in equal but sufficient quantity, to make a contrast with the ground color. The number 5 represents black walnut; the coloring, when desired, consists of a ground of Payne's gray, burnt umber and crimson in equal quantities, using the same mixture with the addition of more burnt umber for the graining. Hard pine, drawn as in 6, is colored with a light wash of crimson lake, burnt umber and gamboge, in equal parts, with a graining mixture of crimson lake and burnt umber.

Woods in general are shown in 4, which should be colored with a light wash of burnt sienna and grained with a writing pen, and a dark mixture of burnt sienna and India ink.

The other sections are solid wash colors and need no explanation beyond that given in the cut. Coloring, in fact, is gradually going out of use, and section-lining is by far the more usual practice among draftsmen.

It is not intended that these sections, and more particularly the coloring, should be used for rough or hurried drawings. In preliminary work for estimates, and in many other cases, well finished and artistic drawings are necessary, and in such instances the conventions given will be useful.

PROOF GOLD AND SILVER.

Written for the Engineering and Mining Journal by Cabell Whitehead.

Since the accuracy of the gold and silver bullion assay is ultimately limited by the purity of the "proof" or standard used for comparison, neither time nor expense should be spared in preparing these standard metals. In the hope that a few words upon this subject may be of assistance to those of my fellow assayers who sometimes find it difficult to understand why the Mint returns do not agree with theirs, I venture to give the method of preparing pure gold and silver in use at the mints.

Gold Proof.—Ten ounces or less of fine gold is rolled out into a ribbon, placed in a flask and the required amount of HCl added at once. HNO_3 is added in small amounts until the gold is dissolved. The flask is now placed upon the sand bath and the solution evaporated until the HNO_3 is entirely removed. This sometimes requires an addition of HCl. When all HNO_3 has been removed, a few cc. of HBr are added, and the solution diluted until it contains not more than 1 oz. of gold per gal. The solution, which was clear, now becomes clouded by the separation of AgCl. This large dilution is made necessary by the fact that AgCl is readily soluble in a concentrated solution of $AuCl_3$. It is almost insoluble in dilute solutions of this salt. The H Br is added, since the bromide of silver is much less soluble than the chloride.

After thoroughly agitating the solution, it is left at rest until it becomes perfectly clear, when the supernatant liquid is syphoned off onto a double filter, care being taken not to disturb the AgCl in the bottom of the vessel. No attempt is made to wash the filter for fear of contaminating the solution with AgCl. The gold is precipitated from the clear solution with a stream of SO_2 gas. By the use of this re-agent copper is perfectly separated from the gold, and no impurities are introduced, as is the case when $FeSO_4$, or metallic aluminum, is used. After being thoroughly washed by decantation, the gold, now free from Pt—Cu; and all but a trace of silver, is dissolved as before, HBr added, and the solution again diluted. A much longer time is required for the second subsidence of the silver bromide and chloride, since the amount present is very minute.

The second precipitation of the gold is made with pure oxalic acid. This re-agent has the following advantages:

1. It does not precipitate platinum from acid solutions.
2. It contains no metal and is perfectly volatile at a temperature below the melting point of gold.
3. It cannot be used, however, with solutions containing copper, as the oxalate of copper is only slightly soluble.

The oxalic acid is added in the form of a warm concentrated solution. The precipitation is complete in six or seven hours. The gold is washed, re-dissolved and allowed to settle as before, when it is precipitated a third time. It is now washed with water, then with HNO_3, and again with water, then with HCl, and finally with water. The dried gold is mixed with about one-fifth its weight of a flux composed of 3 parts of fused borax and 1 part of pure niter, melted in a porcelain crucible and poured into a chalk-lined mould. It is freed from adhering impurities by brushing and finally by boiling in HCl. The dried bar is cut up and rolled out between carefully cleaned rolls. The ribbons are boiled in acid to remove any metal taken up during this operation, and after being heated to redness in the muffle, the gold is ready for use.

While this may seem a very long and tiresome process, it is, nevertheless, the only one which has been found reliable, and the fact that it has to be resorted to only emphasizes how difficult it is to prepare one metal absolutely free from another—for after the first precipitation the gold is only contaminated with silver, and the proportion of this does not exceed one part in 20,000.

Many shorter methods have been proposed for preparing pure gold, but none of them need be discussed here except the one recently published in the "Engineering and Mining Journal," July 9th, 1898, page 36, by Mr. Pack, late assayer of the United States Mint at San Francisco. He proposed, after the separation of the silver, to precipitate the gold by means of pure aluminum. In his method Mr. Pack overlooks the fact that the precipitation of the gold by the old method is simplicity

itself, and that the part of the process which really needed improving was the part which he did not improve, namely, the removal of the last traces of silver from the solution. He furthermore fails to inform us where we are to obtain aluminum which is free from copper, silicon, iron, etc., or what advantages aluminum has over zinc for this purpose, in view of the fact that chemically pure zinc is found on the market, or why either should be used when we have half a dozen re-agents which do no harm, if not perfectly removed from the gold before melting.

Proof Silver.—Proof silver is now prepared in the laboratory of the Bureau of the Mint by subjecting fine silver (.999) to electrolysis, using an electrolyte of silver nitrate with 1 per cent. of free nitric acid. The bar of fine silver is carefully wrapped in filter paper and all enveloped in cotton cloth, so as to perfectly retain the impurities, such as peroxide of lead, gold, etc., which accumulate as the bar is dissolved. The bar so protected is connected with the positive pole of the battery or other source of electricity, thus becoming the anode, while the cathode is formed by connecting a sheet of chemically pure silver to the negative pole. The silver is thrown down as crystals, which are easily washed. In this way pure silver can be prepared with great ease, even in large quantities. In melting the crystals the same flux is used as in the case of gold, but it is necessary to melt the bar a second time. The second melting is made without flux and is for the purpose of removing the oxygen introduced by the niter of the flux. When the silver is perfectly melted it is stirred with a piece of dry wood as long as the action due to the presence of oxygen continues. When this subsides the silver is poured into a chalk-lined mould. The bar is cleaned with a brush and dilute H_2SO_4. After being rolled out it is ready for use.

The method formerly used by the mints was: Dissolve fine silver in dilute HNO_3, allow the gold to settle, dilute and filter. Precipitate silver with pure HCl, wash several times by decantation, and when free from acid pour into a large evaporating dish and allow the precipitate to dry at the temperature of the room. If this temperature is not exceeded, the chloride remains granular, and if boiled with HCL + HNO_3 and washed with pure water, all impurities, such as Au, Hg_2Cl_2, and traces of $PbCl_2$, are perfectly removed. The dried chloride is reduced with pure carbonate of soda, to which a little pure niter is added. This method is much more troublesome and does not produce a purer silver, but may be advantageously used when electricity is not obtainable.

Another very satisfactory method of reducing the purified chloride is by boiling with a solution of KOH and pure milk sugar. After the reduction the silver is washed and fused, as in the case of electrolytic silver.

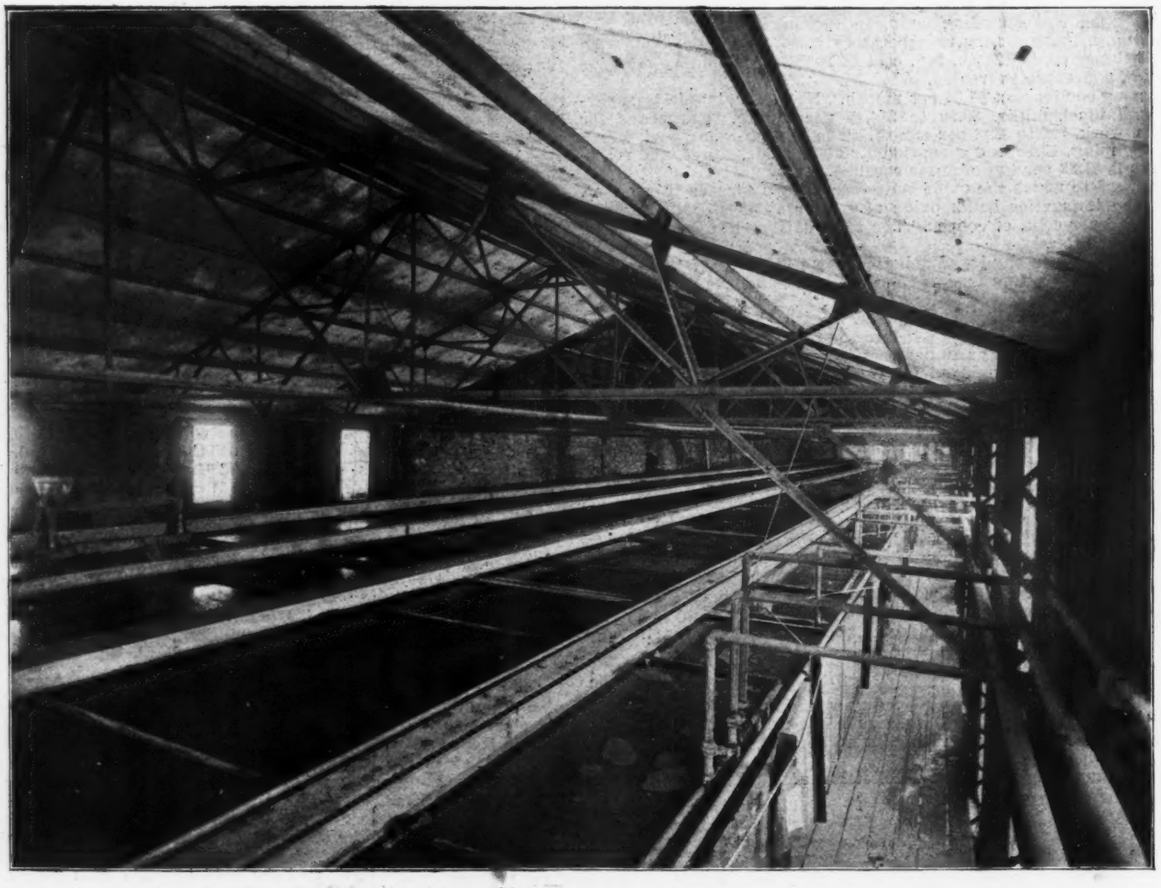
IRON PRODUCTION IN BELGIUM.—During the first half of the present year the production of the Belgian furnaces and iron works reached a total of 502,585 metric tons of pig iron, 250,730 tons of wrought iron and 359,170 tons of steel ingots, including direct castings.

COAL IN BELGIUM.—During the first half of 1899 the coal mined in Belgium reached a total of 16,420,410 metric tons. There were 113 collieries in operation.

GOLD MINING IN SUMATRA.—A report has lately been received by the Redjang-Lebong Mining Company covering the year 1898. The mines, which are situated in Sumatra, have, under the management of Mr. G. A. Wright, given satisfactory results. The gold occurs in a quartz reef in slates of Upper Silurian or Devonian age. A striking photograph inserted in the report shows the nature of the reef, which at the point depicted is 22 ft. wide, and assays 2 oz. of gold and 14 oz. of silver to the ton. This photograph, and others in the report, show the difficulties that have to be overcome owing to the luxuriant tropical vegetation. The mine is equipped with a 20-stamp battery, compressed-air rock drills, electric power transmission and electric lighting plant and cyanide works. The headquarters of the company are in Batavia, Java.

DANGER FROM CYANIDE TAILINGS.—The "Australian Mining Standard" says: "An accident which occurred at the Try It Mine, Paddington, Broad Arrow, Western Australia, about six weeks ago, is responsible for the proposed introduction of a hotly debated clause into the Mines Regulation Act Amendment Bill now before the Westralian Parliament. Three men were filling a stope with tailings fresh from the cyanide agitators, when the shoot choked and shut them off from fresh air, with the result that while one was taken out dead, the other two were with difficulty recovered. It was reported that the men had been poisoned by cyanide fumes thrown off by the wet tailings, but the medical testimony given at the inquest did not bear out this view. The more probable cause was suffocation through breathing bad and insufficient air. But, acting on the other theory, a member has moved that 'no mine owner or company owning a mine, or manager managing such mine, shall permit or allow, or cause to be placed in any mine or workings thereof, open surface workings excepted, any tailings, sludge, or debris which contains cyanide of potassium or other metallic cyanide, or any form of chlorine, or any other chemical resulting from the treatment of such debris.'

"The clause above referred to does not find favor with other members representing gold-fields constituencies, because of the immense expense which will be involved in filling up the stopes if the tailings are not used. It will mean an enormous increase in the quantity of timber required. Eventually it was decided to postpone further consideration of the matter, so that the Minister for Mines could, in the interval, write, through his department, to the Chamber of Mines and the labor associations, asking them for an expression of their opinion of a clause which would give the minister power to frame regulations to prevent the use of poisonous materials in the mines."



Leaching Department, De La Mar's Mercur Mines, Utah.

DE LA MAR'S MERCUR MINES, UTAH.—II. THE ORE TREATMENT.

Written for the Engineering and Mining Journal by H. L. J. Warren.

In the prior article descriptive of the mines proper, published last week, the method of mining was given. The combined shaft and incline terminates at top of the mill, as shown in the drawing given, where the ore is delivered. It is now proposed to follow the ore through its several reductions in size, calcining, roasting and leaching, till the tailings, freed from gold, are dumped outside the mill.

From the skip the ore drops on grizzlies with 1½-in. openings, fine material passing to one of the main ore bins and coarse to Gates crushers—there are 2 of No. 6 pattern—thence to the same bin as the fine material. There are 3 separate bins, for oxidized, mixed and base ore, with total storage capacity of 2,500 tons. The so-called mixed product is a talcose oxidized material which is calcined to red heat to drive off water of hydration, which removes its plasticity. In this form it is locally styled "brickified," and is rendered readily leachable. The base ore has 2 to 5 per cent. sulphur and 0.95 to 2½ per cent. arsenic, and the roasted calcines have 0.1 to 0.15 per cent. arsenic. From the first storage bins each product is fed to a belt conveyor 100 ft. long. These conveyors pass over straight-line dryers, not in commission save when the ore contains so high a percentage of moisture as to render rolling difficult, and at present no such ore is produced. The conveyor delivers the ore to Berthelet screens, oversize passing to coarse crushing rolls, thence over a second Berthelet to finishing rolls. Sizes of screen mesh are ⅜ in. for oxidized material, ¼ in. for mixed, and ⅛ in. for base. When properly sized, the oxidized and mixed products are dumped into bins direct from the Berthelets and finishing rolls. Oversize base material from the Berthelets goes through Gates finishing rolls to elevator, and is carried to top of second storage bins, passed through revolving sizing screens ⅛ in. mesh—oversize returned to fine rolls and all base ore reduced to ⅛ in. or less. All told, there are 6 elevators and 6 Berthelet screens. The second set of storage bins, for the sized oxidized, mixed and base products have, all told, 2,500 tons capacity and each product is still kept separate.

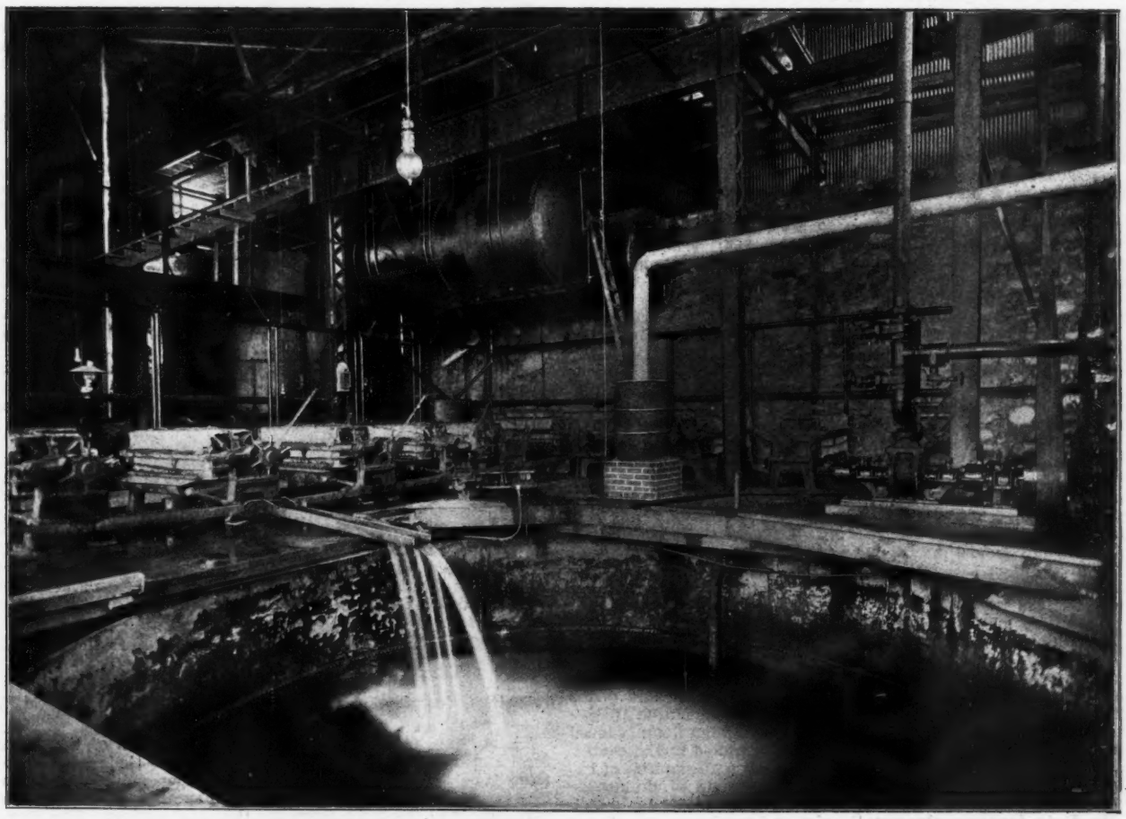
The mixed ore passes from lower or second storage bin to a belt conveyor 75 ft. long carried to the Holthoff-Wethey calcining furnaces, of which there are 2, each 100 ft. by 12 ft.; each treats 145 tons in 24 hours, consuming 8 tons of coal. It takes 6 hours for the ore to pass through them. From the calciners the mixed product is elevated and dumped into general storage and mixing bin above the leaching tanks—500 tons capacity—together with the roasted base ore and raw free leaching or oxidized ore. This mixed product of oxidized, mixed and base is now ready for the leaching tanks. Here is the first time and place that the ore is handled by man since it was broken underground.

From the second storage bin the base ore passes to elevator, is elevated 50 ft., and is distributed by a series of pipes to the new straight-line roasting furnaces of the Jackling pattern of which there are 4, and each furnace has a separate feeder. It takes about 8 hours for the ore to pass through the furnace, and each furnace roasts 70 tons in 24 hours, consuming 7 tons of coal. The calcines are elevated and dumped into the general charging bin, together with the oxidized and mixed.

The oxidized ore passes direct from the second storage bin to the general charging bin. In charging the leaching tanks it is found desirable to first spread about 50 tons of the cherty oxidized material evenly on the bottom, making a bed of 10 in. or so thick and afterward the general product is charged. From this charging bin the ore is fed into side dumping ore cars, and these are pushed by men to the top of the tanks and dumped.

There are 22 steel leaching tanks, and by January 1st, 1900, 4 more will be in commission. Each tank is 50 ft. by 25 ft. and 5 ft. deep, and holds 260 tons for a charge of ore. It takes about 8 hours to charge a tank, or a shift of 3 men.

After a tank is charged, the strong solution—0.4 per cent. cyanide of potassium, or 8 lbs. per ton of water—is turned on from the bottom through ten 2-in. openings till the entire mass is thoroughly saturated. This operation requires about 8 hours, and afterward it is allowed to stand for 16 hours, when more of the strong solution is fed on top and the liquor is drawn off by the same openings through which it was first turned on from the bottom. In the first instance the solution was fed by gravity, not by pressure other than the 14-ft. head from the solution tanks, and in the subsequent leachings the flow is a natural discharge, unaided by any suction or vacuum. The strong solution is fed on top for 24 hours and is followed by a weaker liquor—0.3 per cent. potassium cyanide—which is continued till the charge is ready for the wash of clear water. The period of weak leach varies from 2 to 3 days. In the leaching practice followed the aim is to have about 1 in. depth of liquor in leaching tank pass out each hour, and the best results follow when the total weight of strong and weak solutions and wash water is double the weight of ore charge; thus, in handling 700 tons of ore per diem, about 1,400 tons of solution are precipitated.



Filter-press Room, De La Mar's Mercur Mine, Utah.

After the wash-water is drawn off the charge is ready for dumping. In discharging a tank it takes about 4 hours with 10 men. The tails are shovelled through openings in the bottom of the tanks into cars directly below. Each charge is sampled by 12 auger bores 2 days before the charge goes off, and when the tails are being unloaded a final sample is taken.

The solutions and wash-water flow to the same pregnant solution tanks—two, each 20 ft. diameter and 12 ft. deep—and from these is pumped to the precipitation tanks—three, each 14 ft. diameter and 8 ft. deep. As the liquor flows into the precipitation tanks it is constantly stirred by a ½-in. iron pipe through which air is forced under 20 lbs. pressure, and this agitation is steadily maintained as the tank is filled. Zinc dust is used for precipitating the gold, and this incessant ebullition causes the free zinc at the bottom to throw down more gold. When the tank is first filled 30 lbs. of zinc are put in, 20 lbs. are used on the second charge, 10 lbs. on the third and thereafter, till the clean-up on the end of the month, 15 lbs. of zinc ore are used for each full charge of liquor. After the first charge no zinc is added till the tank is about half full, when one-quarter of the total used for the full tank is put in, the remainder being added as the tank fills. Each full charge of

liquor weighs 30 tons. The precipitation by zinc dust, combined with stirring and agitation by compressed air, is a patent process controlled by Captain De La Mar, and it gives excellent results.

The solution is allowed to settle for an hour and is drawn off to the filter process, which collect the suspended particles. There are 10 Stilwell-Bierce & Smith-Vaile filter presses, 24-in. square section and distance frame pattern, from which the liquor flows in a clear, pelucid stream to the sump—24 ft. diameter and 8 ft. deep. The barren solution rarely exceeds 20c. per ton, while the original precipitating solution carries $3 gold per ton, or thereabout. Amount of zinc consumed per ounce of gold precipitated is 1 1-3 lb. To maintain the solution at a high standard of alkalinity 100 lbs. of caustic soda are added to 100 tons of solution before standardizing with potassium cyanide. This effects a saving of cyanide by neutralizing any acidity in the ore and aids precipitation by causing a more vigorous action of the solution on the zinc dust. It is also found that this increased alkalinity of solution increases the precipitation and decreases the amount of zinc dust necessary.

No definite figures are given out as to the gold content of the battery charge, or the average value of the mixed product that goes to the leaching tanks. The ores of Mercur vary between wide limits, and it is well known that the richest of the district are the base ores of the De La Mar Mines, so that the mill battery depends on the percentage of base treated. At present the oxidized and mixed products form the great bulk, perhaps three-quarters of the total, but when the new roasting furnaces are in commission this proportion will be nearly reversed; for by far the greater tonnage of the ore reserves is base. It is probable that to-day the battery is $6.50 to $7 per ton and the tails are under $1 per ton. All told, 145 men are employed in the mill, or 1 man to 4.2 tons of ore handled, and this force will be further reduced, increasing the tonnage per man.

Monthly clean-ups are made and about one-half the gold is found in the precipitating tanks and one-half in filter presses, though the weight of product taken from the precipitating tanks is threefold that from the presses. The product is carried to the refinery, dried in shallow iron pans in a muffle furnace—where the major part of the free zinc is converted to oxide—pulverized through ¼-in. screen and sampled. At that stage it carries about 20 per cent. gold—the richest clean-up ran $65 per lb. and the average is above $55. When the mill started this product was $20 per lb. and a uniform improvement has been made. It may be noted that, invariably, there is 1 oz. of silver to 100 oz. gold in the product.

Next the product is treated in a dissolving tank in solution of sulphuric and nitric acid which removes the remaining free zinc, zinc oxide, arsenic and mercury, and brings the product to 60 per cent. gold, the other 40 per cent. being largely silicious slimes. This is filter-pressed, dried in a muffle furnace, crushed roughly to ½-in. or less, mixed with flux consisting of 1 part potassium carbonate, 2 parts sodium carbonate, 2 parts borax glass, and melted in graphite crucibles in an oil-burning furnace. Resultant buillion is .950 fine.

The refinery is equipped with every precaution against accident, particularly from poisonous gases. Over the main dissolving tank is a conical hood connected with a large exhaust fan, which carries all the gases generated by the operation to a stack outside the building. As now conducted and simplified, the refining of the zinc product is not hazardous for those versed in the manipulation, and it is well that others should look upon the refinery as a dynamite mine, ready to explode instanter, if they ventured to come in contact with anything—metal or gas—within its doors.

From the dumping of the ore at the crushers to the discharging of the tails from the leaching tanks, every department of the mill works smoothly and evenly as could be wished. It is a remarkably orderly and clean treatment plant, a revelation to those who knew it a year ago. Then confusion doubly confounded, dirt, dust, smoke and chaos held sway. From the outstart—the mill first started in March, 1898—the top and bottom departments, the crushing and leaching floors, caused no uneasiness; the difficulties and obstacles were confined to the center, the calcining and roasting departments. It has taken 20 months of exceeding irksome work and many additional thousands of dollars to bring about the remarkable metamorphosis, the chief credit for which is due to Mr. D. C. Jackling, the metallurgist and mechanical engineer, who began metallurgic tests on these ores in 1895 and has had immediate charge of the mill since the starting of construction. The success of the metallurgy of these ores is his enduring monument. But a new roasting furnace, adapted to the urgent requirements, was demanded and the Jackling straight-line furnace, possessing new features and improvements, was evolved. It gives complete satisfaction. Mr. Jackling was aided by able lieutenants and the new furnace is a composite production of several heads. Mr. Hartwig A. Cohen, the general manager of all Captain De La Mar's mining interests, avers that this furnace is the salvation of the mill and is the ideal roaster.

The most radical innovations of the Jackling furnace, for which patent is applied, are: 1. Independent roasting hearth, outside of main furnace construction. By this arrangement the entire mechanical work—buckstays, tie rods, supporting bracket, carrier rails, etc.—have no connection with expansion and contraction of either the roasting hearth or main furnace arch.

2. Automatic stop, a device that instantly cuts off the power in case of accident, or breakage of either propelling chain. This is of prime importance, immediately recognized by users of straight line roaster furnaces.

3. Automatic plunger feeders, for feeding the crushed ore to the roasting hearth.

4. Elevators, perfect discharge, of special design, deriving power from the idlers on the return end of furnace and discharging the roasted ore on to the upper conveying floor of corrugated iron, where it is cooled by water spray pipes and cooled product is conveyed to feed end of furnace. The fireboxes are located near the discharge or return end, on each side of furnace; the gases pass over the bridge walls into the main roasting chamber and are drawn off to the main flue or stack near the feed end.

5. A special universal sprocket wheel, consisting of a main driving hub provided with recesses for receiving the removable sprocket teeth, which have involutes cast on the side of each that nearly match the recessed involutes of the adjusting plate. These wheels are universal in action, when either expanding or contracting the pitch diameter of the sprocket teeth. When the adjustment plate is thrown the full stop, all teeth are readily removed without detaching the adjusting plate, or any part of the sprocket wheel, and new teeth can be inserted in an instant and adjusted to the proper pitch diameter as desired.

6. Another novel feature in the design and construction of these furnaces is the introduction of special idler wheels on the return end of furnace. The wheels are of plain band face provided with special deflecting flanges on the outer side and are driven by traction only, thus relieving the propelling chains of about 30 per cent. of the wear. The size of the hearth is 12 ft. by 120 ft., and each furnace has a capacity of 90 to 120 tons of ore per 24 hours, according to the character of ore The furnace is shown in the accompanying drawings.

At the time of this visit, early in December, there were 4 of the original roasters in commission, reconstructed and remodeled in line with the Jackling innovations. Three additional Jackling furnaces are nearly ready for service and will be fired, probably, by January 1st, 1900.

Power for mines and mill is supplied by the Telluride Power Transmision Company, by electric transmission, from Provo Canyon, 36 miles distant. A 3-phase alternating 40,000 volt current entering the transformer house above the mill is reduced to 220 volts. All told, the mines and mill require 500 to 700 H. P., which is furnished by 17 motors, as follows: 150 H. P. motor for direct driving hoist; 75 H. P. motor for cage hoist; 125 H. P. motor and 100 H. P. motor for the 2 compressors; two 50 H.-P. motors for Gates crushers; 150 H.-P. and 75 H.-P. motors for fine crushing department; three 20 H.-P. motors for driving furnaces, conveyors, etc.; three 15 H.-P. motors for driving fans for forced draft; 30 H.-P. motor for solution pumps; 5 H.-P. motor for machine shop; 10 H.-P. motor for driving fans in refinery. In addition, for the construction about to be put in commission, there will be a 50 H.-P. and a 20 H.-P. motor for driving new furnaces, conveyors, etc., and supplying forced draft. These motors are all made by the Westinghouse Electric and Manufacturing Company. They are 2-phase induction, known as type C.

The power supplied from Provo is not reliable or to be depended upon, going off without warning; and at times there has been none for days and weeks. This shortcoming is to be speedily remedied and a steam plant is contracted for at the mines, on which the construction is in progress. It will consist of six 150 H.-P. horizontal return tubular boilers—125 lbs. boiler pressure; two Lane & Bodley tandem compound Corliss non-condensing engines, 400 H.-P. each; and two 300 K. W. Westinghouse 22-pole generators, 220 volts, 7,200 alternations, running 327 revolutions per minute.

The illustration of the mill given last week is from a photograph recently taken and shows the annex to the leaching department, just completed. Total height of this structure is 158½ ft. to floor of coarse crushing department, and top of gallows frame is 90 ft. higher, or 248½ ft. in all. Beginning at the top the coarse crushing department occupies a room 76 ft. by 26 ft.; drying department, 82 ft. by 76 ft.; fine crushing department, 100 ft. by 64 ft.; roasting department, 444 ft. by 100 ft.; leaching department, 720 ft. by 64 ft.; precipitating room, 70 ft. by 50 ft. The greatest length of the building is 720 ft. It is built of steel on most substantial masonry foundation, where not cut into solid rock. It is lighted by electricity; the leaching department is heated by steam, and it is in every particular a model, up-to-date treatment plant.

NOTES ON LEAD SMELTING AND GOLD AND SILVER REFINING.*

IV.—FANS FOR HANDLING LEAD FUME.

Written for the Engineering and Mining Journal by M. W. Iles.

There were used two 10-ft. fans at the works of the Globe Smelter for handling the lead fumes, principally for their blast furnaces; but from time to time, it was found that other smoke and fume could be economically saved. These were the fume from each of two dust-fusing furnaces; and the fume from the Iles slag settlers. The slag fume was subsequently found too poor to save, and separate stacks of brick were built for each of the three slag settlers. The fume which arises upon tapping slag and matte was also saved, for a short time only, by the use of fans and the bag-house system; but as the filtering area provided at the bag houses was generally overtaxed by a desire to catch everything which contained any gold, silver or lead, this fume also had to be wasted.

The fume from the furnace which melted down the Doré bars, and other silver products, was found quite rich, and was therefore saved. The fume from one large silver concentrating furnace and two small English cupel furnaces was also saved.

The fume which arises from the Faber-du Faur tilting furnaces was for a long time saved, although the tests showed this was not rich enough to save, but it was drawn to the bag houses by fans and saved, in order to obviate the risk of loss due to breaking of retorts. The fume which arises from the mouth of the retorts of these furnaces, however, contains some value, and by the use of properly constructed pipes and hoods, telescopic and having flexible joints, enables one to collect a valuable product.

The fume from the softening furnaces was saved for a while, but it contained appreciable quantities of antimony, which caused the bullion at the blast furnaces to be hard, and was, therefore, allowed to go to waste. The writer is quite positive that this fume should be saved, but by a separate system of flues, fans and bag house.

The proper system would be one which did not constantly interfere with the fume from the blast furnaces. Nothing should interfere with these furnaces, as upon them depends almost entirely the success of the plant, both from metallurgical and financial standpoints.

The writer made a statement five years ago that if fans were used

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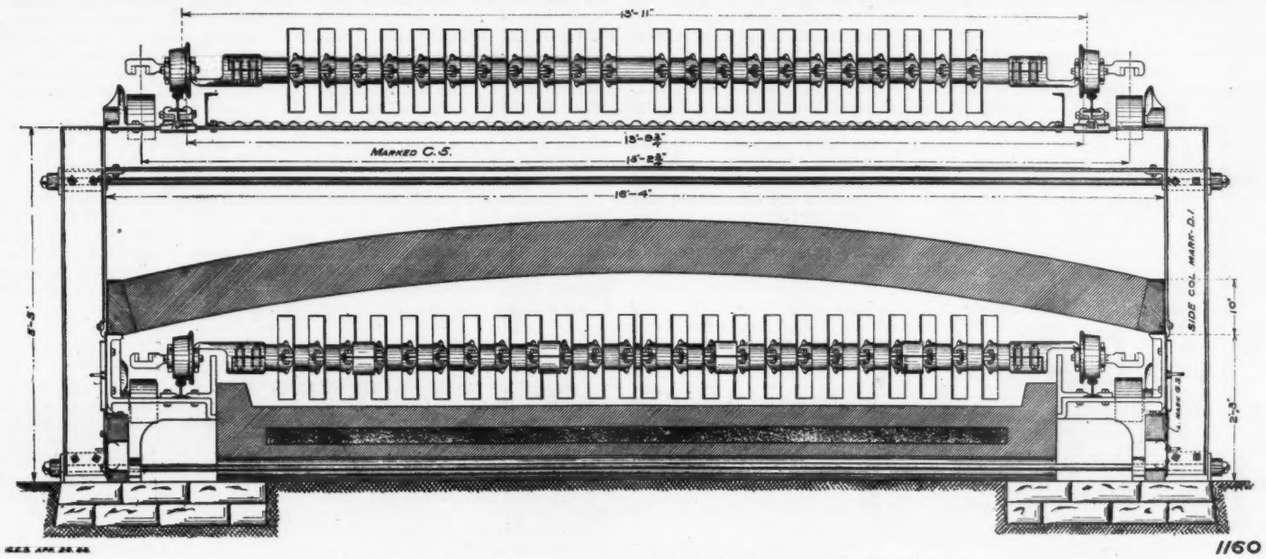
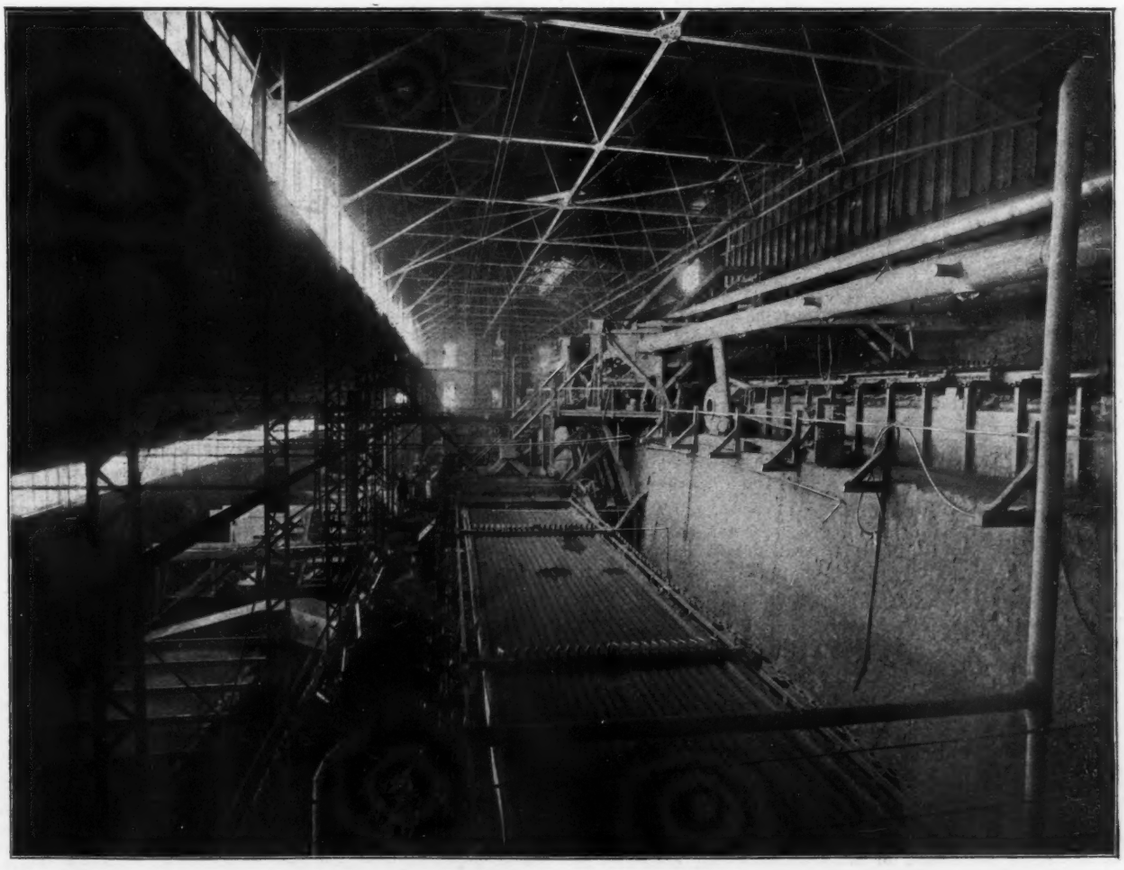
instead of stacks at any kind of metallurgical works producing any kind of valuable fume, great savings would result. I still maintain this position, and desire again to place myself on record as being opposed to stacks for nearly every kind of metallurgical furnace.

The horse-power needed to propel the fan or fans will generally be far greater than that shown by the figures of the most skilled mathematician or engineer.

According to the first calculations there was needed 38 H.-P. to drive the two 10-ft. fans originally installed at the Globe Smelter for handling the fume from the blast furnaces. After much delay and figuring it was thought that a 75-H.-P. engine would be ample, and the size of the engine seemed to grow daily, until the plant was provided with a 200-H.-P. engine, which was found to be an exceedingly wise provision; not because the fans needed all of this power, but because of the use of other small units of power for various purposes, such as driving a Root blower and a dynamo. The engine which drives the fan should be some good well tried type of Corliss engine, running with great reserve power, and at a speed not greater than 40 to 50 revolutions. This engine should be provided with the best oil cups and lubricators. If the line shaft which propels the fans be belt driven, then use much care in getting only the best kind of belt tightener known. The belts of the engine and the fans, if of leather, should have some simple appliance for the abstraction of the static electricity, not only to prevent annoyance, but to relieve any possibility of fire to the ignitable fume particles.



JACKLING ROASTING FURNACE, DE LA MAR'S MERCUR MINES, UTAH.



MIDDLE ROASTING DEPARTMENT, DE LA MAR'S MERCUR MINES, UTAH.

Two fans at least should be provided, which will allow the use of either one of the fans quickly, or both of the fans at the same time, when necessary. Quite frequently conditions prevail by which no better service can be obtained by running the two fans than by using one fan only. Beyond a certain revolution of the fan there will be ex-

pended much power without a corresponding gain in the improvement of the draft and an increased pressure on the inside of the bags.

At the bottom of the fans there should not be any pit in which the fume is allowed to accumulate, but the bottom should be of closely fitting brick, built circular in form and corresponding to the outer circle of the fan; and this circle should be sufficiently close to the blades of the fan to produce a scouring action and prevent lodgment of fume. Especial attention should be given to this last named style of construction, otherwise much power will be uselessly expended.

The blades of the fan should be very securely riveted to the arms or spokes of the fan, and not bolted on as is the usual style of construction. The blades should be examined from time to time in order to see that they have the proper curvature and that they have not become loosened. Every two or three months they should be cleaned from the adhering fume; this can easily be done by striking the blades with a medium size ball-peen hammer, but not so hard as to bend or loosen the blades. The encasing sheet-iron shell of the fan should also be hammered on the outside to dislodge the adherent fume.

It is not good construction to have the blades attached to an overhung shaft, even where two fans are placed upon the same foundation. The fan foundation should be extra heavy, and the fan bolts should be large and strongly anchored into the foundation.

The outboard bearings should be provided with especially rigid foundations, and the supports for the overhung shafting, when used, should be cast in one solid piece, heavily ribbed and set like an engine. Long, adjustable boxes should be provided for the fan shaft, and these boxes will possibly have to be water cooled.

The ducts to the fan should be large and free from angles; and if the arrangement contemplates the use of two fans, then the deflecting fan gate should have much care and attention given to its hanging in order that it may close and open easily without shutting down the blast furnaces. The gate should close tightly, but this last condition seems to be an exceedingly difficult one for the engineers and mechanics. There should be provided an easily opened, close fitting sliding door, in close proximity to the fan mouth, in order to admit variable quantities of cold air, so as to regulate the temperature at the bag house. In this connection it might be well to state that when the temperature of the gases at the bag house has reached 300° F. it is dangerously high. The muslin bags will soon get charred, the nap becoming brittle; and, furthermore, there is great liability of the fume of blast furnaces (mainly sulphide of lead) igniting and producing a train of troubles and annoyances and delays, which to distinctly particularize would not at this time be pertinent to our subject.

The pipes leading from the fans should be larger than the size indicated by theoretical calculations: angles, sharp turns, or anything of an obstructing character, should be studiously avoided.

Some mathematical data of a reliable character we can give. During November, 1898, the engine which drives the fans was indicated and there was found to be a development of 140 H.-P., but in addition to the operation of one Sturtevant fan there was a small Root blower attached, which was estimated to consume 20 H.-P. The friction on the countershaft is probably 10 H.-P., making a total of 30 H.-P. lost. In other words, it is taking actually 110 H.-P. to do the work with one fan. Now this work consists in moving 186,000 cu. ft. of air per minute. The velocity near the mouth of the fan was 1,240 ft. per minute, and the cross-sectional area was 150 sq. ft. The bag house engine was making 52 revolutions per minute and the fan 305 revolutions per minute. The periphery speed of the fan was 9,612 ft. per minute. The actual horse-power in moving the fume we have figured to be 38. From the figures herein above given it will be noted the efficiency of the fan is 34.5 per cent., indicating a loss of 65.5 per cent. It must not be immediately concluded that this fan was doing poor work or that the Sturtevant fan is of poor design and low efficiency; but when one takes into consideration the enormous work performed by a fan of this size, and how tremendously the fan was overcrowded, then a more conservative view may be taken. It is not the fault of any machine, engine, tool or boiler that we find so many reckless cases of overcrowding. And again it is frequently not particularly blamable when certain portions of an industrial plant are overtaxed, as the conditions of trade often make this as imperative as the overtaxing of an individual.

According to the calculations of Mr. M. S. Fallis, the periphery speed of this fan should be between 5,000 and 6,000 ft. per minute. A reading of the temperature of the gases handled by this fan showed it to be 250° F. In the study of this fan and its operations from a scientific standpoint, my able assistant, Mr. M. S. Fallis, constructed (rather invented and perfected) a manometer of marvellous sensitiveness, and he and others could most easily read either pressure or suction registrations of 0.001 oz. This thousandths reading was more accurately and quickly done than tenths by the ordinary manometer.

Now by the use of Fallis' manometer we found that the pressure immediately back of our blast furnaces, which produce the fume we desire to handle, ranges from 0.06 to 0.09 oz. per square inch.

We find that this vacuum pressure, at this particular part of the plant, should be at least 0.25 oz. To have at least this amount of suction, and possibly 0.3 to 0.35 oz. is a matter of importance to all smelters of lead ores, as I can positively testify, and it would seem that even where copper or other metals were smelted that this same amount of draft would be necessary. Upon this vacuum pressure is dependent the health of the workmen, the steadiness with which they work, the proper working of the furnace, and a good feeling between man and master. And, furthermore, we find that great losses are sustained by a wastage of the dust and fume, which are far more valuable than generally believed, even by those having many years experience in the actual handling of this particular kind of furnace.

After leaving the blast furnaces the pressure gradually increases from 0.09 until we find, at or near the mouth of the fan, a vacuum pressure ranging between 0.33 and 0.34 oz. per square inch. The vacuum at this point ought to be at least 0.5 oz., where the works are provided with proper fans and proper filtering capacity.

In this connection it is well to state that the service of the fan is not only to withdraw the smoke from the blast furnaces, but also to force the gases through textile fabric, which presents some resistance, and the fan should work against a vacuum pressure of 0.5 oz. and produce a positive pressure of 0.4 oz.

Would it not be wiser to consider the advisability of putting a fan up closer to the blast furnaces in order to get a very sharp draft on the blast furnace feed floor, and make this auxiliary fan tandem to the fan close to the filtering establishment? In this case we would obtain a clean and healthy feed floor, free from losses incident to losses of smoke, and at the same time make the fan at the bag house department far more efficient. The writer can see some objections, yet he believes they could be easily surmounted.

It is the opinion of both Mr. Fallis and the engineering department of the B. F. Sturtevant Blower Company that in order to best fill the conditions herein named a materially larger fan, say possibly 20 ft. in diameter, and having a much slower velocity, should be used.

In conclusion I will say that it would certainly furnish not only interesting, but valuable literature to obtain from all the large fan makers of Europe and America, answers to this question: What size and description of fan they would recommend to move 186,000 cu. ft. of smoke per minute, at a temperature of 250° F., against a total pressure of 0.9 oz. pressure per square inch. The fan should not be allowed to stop more than six times per year.

THE JEFFREY THIN VEIN COAL CUTTER.

The difficulty and expense of working thin veins of coal has been usually so great that in many localities mining in thin veins has been entirely given up. That these veins may be worked it was apparent that some mechanical means of performing the various operations must be adopted. The most natural remedy was the introduction of the standard undercutting machine, which for so long a time had been used for undercutting in thicker veins, but the construction and weight of these machines precluded their use for the thinner veins. It therefore became necessary for some one to develop a machine which would be particularly adapted to thin vein mining, and the Jeffrey Manufacturing Company of Columbus, Ohio, designed the machine which is now known as their 16 A thin-vein coal cutter. After a period of experimental work the machine was placed on the market and has fully demonstrated its ability to perform the work in an entirely satisfactory manner. An illustration of the machine is given herewith and it can be seen that the general construction is such as to insure the greatest strength and durability and to occupy comparatively little space. The general construction is somewhat similar to the standard type of machine for thick veins but it differs greatly in many of the details. Each part has been carefully considered and designed in order to obtain a machine which would combine both strength and lightness in the smallest possible space. There are now a number in use and there are many mines now dependent upon this machine for their entire output.

The outside frame is constructed of two steel channel bars at the top and two angle irons at the bottom, firmly riveted to steel cross-ties, forming a strong and rigid frame on which the carriage slides. At the front the channel bars are firmly held in place by a heavy cast steel cross-girt which also forms a support for the front jack and a guide for the inside frame or center rail. At the rear of the outside frame is a steel bar on which rests the rear jack. To the front cross-tie is attached a shoe-board on which the machine slides when being moved along the face of the coal. This extends across the entire width of the machine and is about 4 in. wide, being covered with boiler plate in order to make a hard smooth surface upon which the machine can slide easily on the floor of the room or entry.

The inside frame or center rail consists of a heavy channel, upon the sides of which are riveted square steel sliding bars which serve to stiffen the frame and to take the wear. At the front end of the center rail is the cutter-head, which is firmly bolted to the rail. This cutter-head consists of two steel plates accurately planed and milled and bolted together, forming a guide around which the chain carrying the cutters runs. From each corner of the cutter-head, chain guides extend to the rear of the center rail, being placed in such a position that an isosceles triangle is formed about which the chain runs, being driven from the apex by a sprocket and passing around the cutter-head upon two idler sprockets, one located in each corner of the cutter head, thus decreasing the amount of friction to a minimum. Means for varying the tension of the chain are provided at the point where the center rail is joined to the carriage. The chain which carries the cutters is extra heavy and is made up of cast steel solid links, in which is a socket for holding the bits, the latter being held in place by means of set screws passing in at the side of the link. These solid links are joined together by drop forged strap links so constructed that at least 50 per cent. of the wear is taken by them.

The bits are made of tool steel and are so formed that they can be easily made and at least 75 per cent. of the material used before discarding. The chain, being the part of the machine coming in direct contact with the coal, has been constructed very carefully so that the least strain may occur and wear and tear reduced to a minimum.

The carriage upon which the motor rests is of cast steel and contains bearings for the main feed and pull-back shaft. Upon this carriage is mounted the motor. This is of the multipolar type, having four poles and two coils. The armature if iron-clad, being drum-wound with formed coils. It is thoroughly ventilated so that the greatest capacity possible may be obtained with a sacrifice of the least amount of space. The commutator is of pure hard-drawn copper thoroughly insulated with soft mica. Cross connections are used, thus requiring but two brushes. The starting rheostat is specially designed for this machine and is located in a position where it is thoroughly protected from damage and also convenient to the machine operator.

All gears are machine-cut of steel or bronze and made separate from the shaft. All bearings are large and of ample area to insure minimum wear. No babbitt is used, all bushings being made of bronze and replaceable. The height of the machine over all is but 18 in., and when

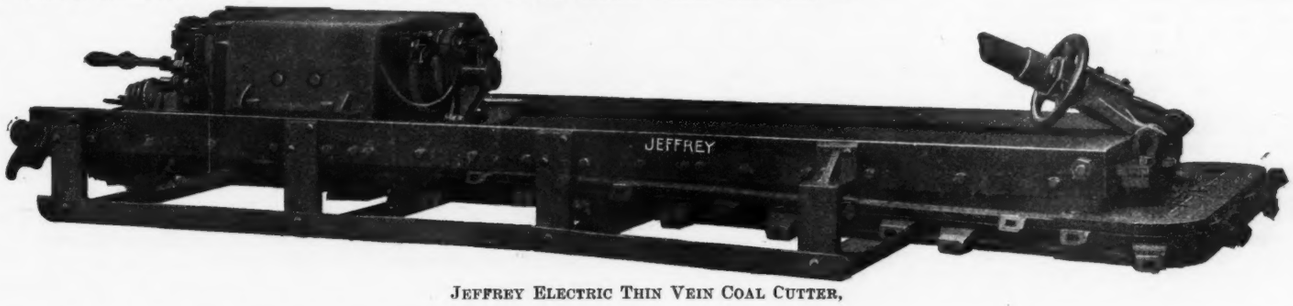
mounted on the truck it can be moved in a space of about 30 in. It will make a cut 5 ft. or 6 ft. in depth by 44 in. in width, with a kerf of about 4 in. The rate of making this cut can be varied according to the character of the coal which is to be cut by changing the gears for feed and pull-back. The motor can be wound for a voltage of 110, 220 or 500. The weight of the machine complete without truck is about 2,500 lbs.

Where heavy grades are encountered the self-propelling truck can be used by which the motor is utilized in moving the machine from point to point about the mine. All parts are of high grade material and are finished in a workmanlike manner. The machine as a whole is complete in every respect and has already caused rapid strides to be made in reclaiming the coal which occurs in thin veins.

SOME ARIZONA MINING DISTRICTS.

Written for the Engineering and Mining Journal.

The Santa Fe, Prescott & Phoenix Railroad, leaving the Santa Fe proper at Ash Fork, runs southward through Yavapai and Maricopa counties in Arizona to the terminus at Phoenix, a distance of 197 miles. A recently constructed branch of this road, 32 miles in length, known as the Prescott & Eastern, runs southeasterly from Prescott to Mayer, and the construction of this branch has had an important influence in the development of the Big Bug, Chapparal, Agua Fria and other mining districts of Yavapai County.



JEFFREY ELECTRIC THIN VEIN COAL CUTTER,

Before dealing in detail with these developments it may be stated, by way of preface, that Yavapai County comprises an area of 8,000 square miles. It is bounded on the west by Mohave and Yuma counties, on the north and east by Coconino and on the south by Maricopa County. Some fertile valleys are scattered between the mountain ranges, but on the whole it is a rough and rugged mountainous region. The climate is temperate, with no extremes of heat or cold, making it possible to engage in mining operations throughout the entire year with no loss of time by reason of inclement weather.

While its development may be considered to be little more than in its infancy, the mineral wealth of Yavapai County is already very considerable. The production of copper in Arizona last year amounted to 110,823,864 lbs., Yavapai producing 48,000,000 lbs. This year the total production of the Territory will probably exceed 150,000,000 lbs., and Yavapai will contribute its full share of the estimated increase. Gold was produced during 1898 to the value of $1,570,288; silver, 263,439 oz. The total value of all mineral produced in the county foots up close on $8,000,000, and these figures, owing to the enhanced values over 1898, will be very considerably increased during the current year.

To get back to the railroad; close to Mayer is a bed of onyx which, in the opinion of stone experts, is one of the very finest and most considerable deposits of this ornamental mineral in the world. The beds are of great depth, well situated for working, the stratification is regular, the material unexcelled for beauty and variety of color, and the extent of the deposit may be gathered from the fact that 208 acres are held under one patent by Senator Fowler of Elizabeth, N. J., and Messrs. Stephenson of Hoboken, N. J., and Black of New York. An adjoining 60 acres is held by a Mr. Bowen, who resides in Mayer. The first named holding, on which considerable work has been done, represents in its present shape a capital outlay of $160,000, and when some matters of a personal nature which led to the stoppage of the quarry have been satisfactorily adjusted a valuable and important addition will be made to the industries of Yavapai County.

Two miles up line, and close to the railroad, is a placer deposit of some 1,200 acres, 30 ft. in depth. This placer ground has been proved by actual working on a very limited scale and with the roughest of appliances, but promises well. Some English capitalists are negotiating for this property, it being their intention to work it with steam shovels and other modern appliances. It has been favorably reported on by their engineers and the deal is expected to be closed very shortly. There is said to be plenty of equally rich placer ground lower down the Big Bug Creek, but an increased water supply would have to be developed to work it.

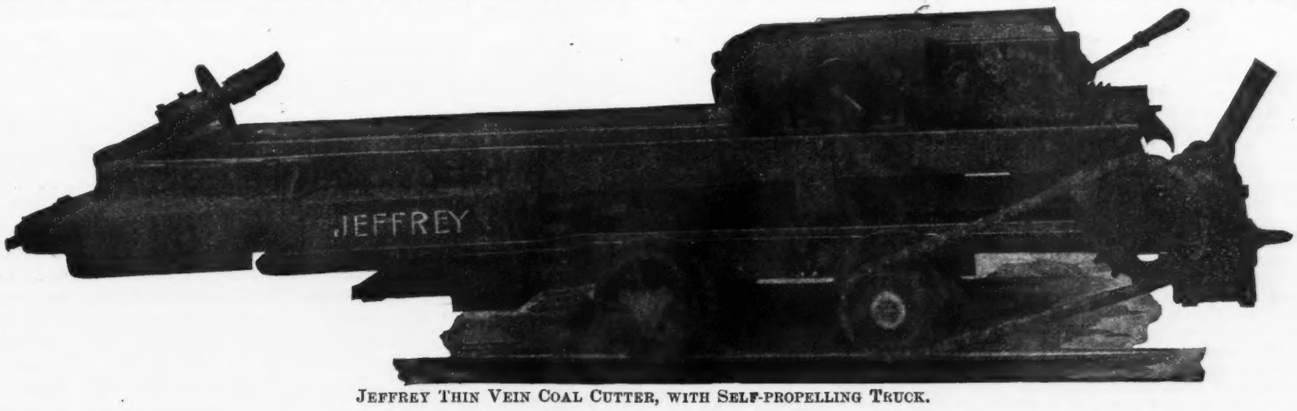
About 1½ miles north of Mayer, and close to the railroad, is a smelting plant formerly worked by Phelps, Dodge & Co., in connection with their Boggs & Hackberry mines, which has lately been leased to the Arizona, Eastern & Montana Company. This plant, which consists of two 36-in. diameter water-jacketed furnaces with a capacity of 30 tons each for 24 hours, and which was in somewhat dilapidated condition, has been put in working order by the last named company. A 23 days' run in September and October resulted in the production of 104,514 lbs. of matte, carrying values of 1.80 oz. per ton gold, 37.12 oz. per ton silver and 57.85 per cent. of copper. Lime for fluxing is obtained at a distance of a quarter of a mile and iron stone at 2 miles. The coke comes from Colorado.

The ore smelted was from the Lone Pine Mine belonging to the Arizona, Eastern & Montana Company, and custom ores from the Blue Bell, Gopher, Sterling and Auburn mines, all within a radius of 8 miles; also concentrates from the Gladiator Mine, some 20 miles distant.

The establishment of this smelter has undoubtedly encouraged mining operators in the Big Bug District, as they are now enabled to have ores and concentrates treated which would not bear the cost of shipment to the New Mexico smelters.

The Lone Pine Mine mentioned above, situated about 5 miles northeast of the Smelter, and on which considerable development work has been done, is turning out some 20 tons per day of valuable ore.

Two miles northeast from the Huron depot (5 miles from Mayer) of the Prescott & Eastern branch is the McCabe Mine, which has been running regularly since 1893. About 50 men are at present employed in this mine, which is shipping 3 carloads of rich concentrates per week to Silver City, New Mexico. The shaft is down 600 ft. and the mine is developed on 6 levels, about 1,100 ft. on each level. Sinking has just been restarted, it being intended to deepen the shaft to 1,000 ft. Like most of the mines in the district the ore at the McCabe was partly free down to water level, but from water level became sulphide in character. It concentrates easily, however, being treated by Wilfley concentrators. The ledge varies from 6 in. to 5 ft. of ore and carries values in gold, silver and copper, the gold being the most important item. There is a 10-stamp mill at the McCabe and the mine is well and substantially equipped. The double-drum steam hoist is of 60 H.-P. capacity, the load lifted being about 2,000 lbs. The maximum power of the hoist is, however, 5,000 lbs., there being plenty of margin in this and in all other respects for the increased production that will follow on the deepening of the shaft.



JEFFREY THIN VEIN COAL CUTTER, WITH SELF-PROPELLING TRUCK.

About 1½ miles north of the McCabe is the Jessie, owned by John S. Jones, a gold mine that has been a big producer in its time. It has been laid off for the last few months, but preparations are now being made for resuming work. Southeast from the Jessie is the Dividend Mine, where a 5-stamp mill is in operation. All over this district a good deal of prospecting work is being done.

Two miles east from Huron depot is the entrance to the Big Bug Gulch. Ascending the gulch, the Henrietta Mine, on the right, is first encountered. This mine, which is equipped with a 20-stamp mill and

has over a mile of development work, is turning out some good ore, but only five of the stamps are at present working owing to a scarcity of water. Across the gulch, to the left, is the Butternut, with a shaft down 175 ft. in good ore (copper oxides) and making a very favorable showing.

Three miles further up is the tunnel of the Oriental Mining Company, which has been driven a distance of 1,500 ft. in the direction of the Lottie Group of claims owned by this company, which also owns the Postmaster and Dartmouth groups, the 3 groups comprising 23 claims. It is intended to develop these properties by driving the tunnel a further distance of 4,500 ft., which will give, in places, a cover of 1,100 ft. A 10-stamp mill on the Lottie Group is now working on some of the oxide ores of the upper measures, which are rich in copper.

About a mile from the Lottie is the Sterling Mine, owned by M. S. Taft, where a shaft 175 ft. in depth has been sunk on a 5-ft. ledge of ore, carrying values in gold, silver and copper. At the first level, 118 ft., about 300 ft. of development work has been done and the sulphide ores are making their appearance. These ores, which are shipped to Silver City and El Paso for treatment, yield values of from $4 to $25 gold, $8 to $27 silver and 18 per cent. copper.

A mile further up the gulch is the Providence Mine, now owned by Fairbanks & Morse of Chicago. It was started four years ago and the shaft is down 400 ft. The total amount of development work is some 5,000 ft., at a cost, including the mine buildings and plant, of from $125,000 to $150,000. The mine is equipped with a 10-stamp mill and has powerful hoisting and air compressing appliances. The Red Jacket Mine, on the opposite side of the gulch, and 10 claims held under the title of the United States Treasury Gold Company, on which considerable development work has been done, are owned by the same parties. The three properties mentioned have been shut down for some time pending the decision of a contest regarding title to one of the claims, but it is expected that work will be resumed very shortly.

About 1½ miles nearly due west of the Red Jacket is the Hamilton & Poland Mine, in which Mr. F. M. Murphy, president of the Santa Fe, Prescott & Phoenix Railroad, is interested. One tunnel of a continuous length of 3,500 ft. has been driven, and altogether some 4,500 ft. of development work done, at a cost of $80,000. This mine is all ready to become a producer and it is the opinion in the district that it is only waiting for an extension of the Prescott & Eastern branch into the Big Bug Gulch.

Just beyond the Providence is the Red Rock Mine, belonging to California owners, where the shaft is 360 ft. in depth, and upward of 600 ft. of development work has been done on each of three levels. The ores are sulphides, an average analysis of the concentrates being: Sulphur, 43 per cent.; iron, 42 per cent.; the balance in copper, gold and silver. The concentrates are particularly clean, containing only about 2¼ per cent. of silica. They are shipped to Silver City, New Mexico. The mine is equipped with a 50-H.-P. steam hoist, two Tremain steam stamps, with a capacity of 40 tons per day, a Gates crusher and tank water storage for 40,000 gallons.

Beyond the Providence are the Gold Bullion and New Home prospects, which are in course of development and making a favorable showing. Prospectors are busily at work all through this region and there is great activity in the Big Bug District generally.

About 18 miles south of Mayer is the Richenbar Gold Mine. There are three shafts on the property, each of them 285 ft. in depth, and two levels with 450 ft. of development and one with 250 ft. The ores are iron sulphides, which carry the values, and the ledge at the bottom of the shaft and in the levels is 24 ft. wide, the walls not having been seen yet. Scarcely any stoping has been done and with the work now open upward of 12,000 tons of ore are in sight.

Before the Prescott & Eastern was constructed it meant a haul of 50 miles to get the concentrates to a railroad, but the present improved facilities have encouraged the North American Exploration Company to take hold of the Richenbar Mine, and a 22-H.-P. gasoline hoist, an air compressor of like capacity and 3 Sullivan drills have just arrived at Mayer and will be put in place by the end of October.

Four miles northeast of Mayer is the Copper Mountain Mine, owned by I. T. Stoddard, in association with some Omaha people. Considerable work has been done on this property for the past 19 years, during which time, from first to last, upward of $260,000 have been expended on exploration, development and plant. The ground in the upper measures was leached with branches of ore remaining, in places indicating the probability of a large body of ore being found when permanent water level was reached. These expectations have, within the last few weeks, been realized, a body of sulphide of copper, carrying values in gold and silver, having just been struck in the exploration shaft. A vertical double compartment shaft is now being sunk on this ledge and a 22-H.-P. gasoline hoist has just gone through Mayer on its way to the mine.

About 4½ miles southwest of Mayer is the Blue Bell Mine, owned by J. Edward Addicks of Delaware. The shaft, commenced in July last, is down 125 ft., and some 40 to 50 ft. of cross-cutting has been done, exposing a ledge of copper sulphides.

At the Silver Chord Mine, 14 miles southeast of Mayer, some Wisconsin capitalists have driven two tunnels of about 100 ft. each on a ledge which carries considerable values in silver and lead. This is a recently started enterprise.

About 14 miles in an air line southwest of Mayer (but 24 by road) is the Crowned King Mine, one of the largest producers and most valuable mines in Yavapai County. The shaft, which is down 650 ft., has a 60-H.-P. hoist, with 80-H.-P. boilers. Between 13,000 and 14,000 ft. of development work has been done on the levels and there is over 1,000 ft. of cover on some of the workings. A new air compressing plant has just been erected and the shaft is now being deepened with an underground hoist of 30 H.-P. The mill is about 1 mile south of the mine and contains a battery of 10 stamps and 8 6-ft. Frue vanners. They plate as well as concentrate at the Crowned King, for, somewhat strangely, the sulphides, which came in almost at grass roots and continued down to the present depth of the workings, have been replaced by free ores. These free ores are probably richer than any gold ores being raised throughout the Territory.

In this district of the Bradshaw Mountains, and within a radius of a few miles of the Crowned King, are other mines, the Gladiator, the War Eagle, the Watsonville, the Old Tiger, the Big Bell, the Star, the Buster and Standard groups, where some important strikes have lately been made; besides prospects too numerous to mention.

The cost of freighting is still one of the drawbacks to this district, but things are improving. The rate to Prescott before the railroad to Mayer was opened was $21 per ton. Now the concentrates are hauled to Mayer and supplies brought in from that depot at a cost of $12.50 per ton. The development this district of the Bradshaws is making will ensure railway communication being effected in the near future.

QUESTIONS AND ANSWERS.

(Queries addressed to this department should relate to matters within the special province of this periodical, such as mining, metallurgy, chemistry, geology, mineralogy, machinery, supplies, etc. As it is manifestly impossible to devote space to all the questions and notes constantly received, preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot here undertake to give professional advice on problems requiring special investigation and which should be obtained from a consulting expert. Nor can we undertake to give advice about mining companies or mining stocks. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers should send their names and addresses. Anonymous questions will not be answered. Preference will, of course, always be given to questions submitted by subscribers.—Editor E. & M. J.)

Conveyors.—I have occasion to handle a material which is very gritty, and cuts out the metal-buckets of a conveying plant I have installed. Can you tell me what is the best kind of a conveyor to handle large amounts of gritty material? K. J. R.

Answer.—This is one of those questions that we cannot undertake to answer. Each type of conveyor, whether a screw, a chain with buckets or scrapers, or an endless belt, has its merits, and can be installed with advantage in certain locations. In our advertising columns, you will find the addresses of a number of firms that make a specialty of manufacturing conveying devices, and a perusal of the catalogues they issue may give you some help. To handle large quantities of very gritty stuff, it will probably pay you to have a plant built to order out of materials specially designed to resist wear.

Platinum Ores.—A man who calls himself a mining expert has shown me specimens of rock containing free gold and another mineral which he says is platinum. He says that he has a quartz vein 6 ft. wide, situated in the Cascade Mountains, full of the stuff. Does platinum occur in veins? A. H. F.

Answer.—All stories regarding finds of platinum are to be taken with some reservation. The metal is of rare occurrence, and its value makes it a tempting object for mining fakirs. The metal almost always occurs native, alloyed with iridosmine or other metals of the platinum group, and often with some iron. It is usually found in placer deposits along with gold, but has been found in place in certain very basic igneous rocks of the type known as peridotites, or in rocks such as serpentines, that have resulted from the metamorphism of peridotites. The metal in hand specimens can be told by its high specific gravity, its silvery white color when fractured, its malleability, and its infusibility before the blow-pipe. It is never found in vein formations native. One of its ores, an arsenide—sperrylite—occurs in veins in the Sudbury District, Ontario. This mineral, however, is extremely rare.

Phosphate Rock.—Is a deposit of phosphate rock containing 70 per cent. phosphoric acid valuable enough to pay for opening? There is a large amount of rock in sight, but the nearest railroad is 20 miles away and freight charges are pretty high. H. P. C.

Answer.—The value of a phosphate mine depends largely on its nearness to a market. A rock containing 70 per cent. acid would be sought for only by manufacturers of superphosphate, that is to say, the large fertilizer concerns, and would not stand a heavy freight charge. As you will see in our market columns, the Tennessee high-grade rock goes 73 to 83 per cent. phosphoric acid, and the Florida rock 78 to 80 per cent., while the South Carolina contains but 36 per cent.; but the South Carolina deposits are situated close to tide water, are cheaply mined, and reach the fertilizer factories without a rail-haul. Another and very important factor in determining the commercial value of phosphate rock, is its percentage in the oxides of iron and alumina. These substances do not decrease the fertilizing value of the rock in any way, but cause the superphosphate made from it to cake badly, interfering with its handling in shipment, and its application to the soil. The Tennessee high-grade rock is guaranteed to contain not over 3 per cent. of oxide of iron and alumina, while the Florida rock contains perhaps 2.3 per cent.

THE BRITISH SALT COMBINE.—The long-anticipated combine in the salt trade has been finally accomplished at a meeting of manufacturers in Liverpool. The amalgamation takes the name of the British Salt Association. Committees were appointed to arrange details and prices were revised. Mr. T. Ward, managing director of the Salt Union, is chairman, and Mr. Jowitt, of Messrs. Bowman, Thompson & Co., vice-chairman.

AN AUTOMOBILE ORE WAGON.

The Auto-Acetylene Company of New York has been developing an automobile and has had an expert in Europe investigating the automobile carriages in France, Germany and England and the motor contrivances used there. After two years' testing, modifying and perfecting the mechanism of the automobile, the company has an automobile that will meet the requirements and which is safe, reliable and capable of performing good work. The purpose is to make automobile wagons, and especially heavy trucks, drays and coaches. The motor adopted works successfully. It has carried one of the wagons over the road

FIG. 1.—AUTOMOBILE TRUCK OR ORE WAGON, MOHAVE, CALIFORNIA.

for 6,300 miles with but one accident. It is provided with a motor, carburetter and steering apparatus that meet requirements. The machine is capable of going up and down ordinary grades at a speed suitable for such navigation without fear of a breakdown. The motor runs almost as noiselessly as an electric motor, there is no odor, no danger of explosions, and the operator is not compelled to take out a license as an expert engineer in order to be allowed to manipulate this automobile, nor must he be an expert electrician. Any one can be taught to operate the wagon in a few hours' time, and it is as easy to start or stop it as anything of the kind possibly can be.

A feature that has always been a drawback to the gasoline-driven automobile is the odor that permeates the whole structure on account of the burned gas or the volatile element of the hydrocarbon escaping through the most closely fitted valves and connections of the engine. This is a feature the Auto-Acetylene Company's expert claims to have overcome, and there is no penetrating odor escaping through the mechanism of the wagon.

The illustration, Fig. 1, shows an automobile suitable for carrying ore, mine supplies and the like; it is to be put in service at Mojave, California. Fig. 2 illustrates the running gear of the company's standard truck upon which any desired body can be placed.

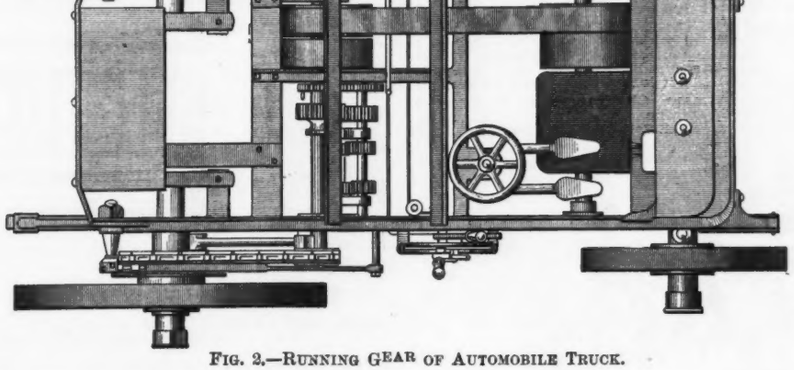


FIG. 2.—RUNNING GEAR OF AUTOMOBILE TRUCK.

The company has completed negotiations for a factory at Hyde Park, near Boston, and another at Greenpoint, New York, the intention being to use the Hyde Park factory for the construction of the regular line of automobiles, while the Greenpoint factory will be used for special vehicles and a department established for general repair work of all kinds of automobiles. Both factories are equipped with modern machinery for the manufacture of high-grade automobiles.

It may be added that, while the rubber-tired or bicycle wheel can be used, if preferred, the company's practice has shown that a good substantial wagon wheel is preferable, even with the lighter class of vehicles. To be durable the running gear should be firm and rigid.

PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

The following is a list of the patents relating to mining and metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

Week Ending December 12th, 1899.

638,689. FURNACE. John B. Asher, Oakland, Cal. The combination with a furnace having a firebox, of a hollow box or tube arranged to surround said firebox, obliquely-arranged tuyeres projecting horizontally from said box or tube and provided with central bores communicating with the latter, and an air-pipe communicating with said box.

638,722. APPARATUS FOR ELEVATING, TRANSPORTING AND DISCHARGING MATERIAL. Ole Johnson, Milwaukee, Wis. The combination of a track, a carriage adapted to travel on said track, a bucket having pivoted bottom sections, mechanism for permitting of the opening and closing of said pivoted bottom sections, drums, mechanism for causing the rotation of either of the drums in either direction, a hoisting-cable connected to the carriage and extending downwardly to and around a pulley connected to the bucket, and thence extended for connection to one of the drums, a counterweight, an opening and closing cable connected to the carriage and thence extended to the counterweight, and from the counterweight to one of the drums, and another cable engaging the last-named drum and continuing from the last-referred-to cable, and extended for connection to the opening and closing mechanism of the bucket.

638,774. MOLD FOR CASTING ROLLS. George E. Thackray, Westmont, Pa. The combination with a mold, of a series of internal rings formed in sections, and pins for detachably retaining said rings in place, said pins being easily breakable by the movement of the casting without injury to said casting.

638,853. ROTARY PUMP. Augustus G. Snyder, Ilion, N. Y. The combination with a revolving piston and its shaft and the casing enclosing the said parts, of a tube on the shaft having a flange between the end of the piston and the inner side of the casing, a threaded plug entering the casing, and bearing upon the end of the tube.

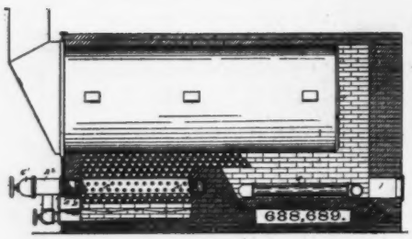
638,855. SOLDER FOR ALUMINUM OR OTHER METALS. Charles B. Thwing, Galesburg, Ill. As a solder for aluminum and other metals, an alloy of tin, bismuth and zinc, the tin being considerably in excess of the other metals.

638,856. ROCK-DRILL. Granville S. Ullathorne and Herbert P. Vacher, London, England. A rock-drill comprising a working cylinder closed on both ends by suitable covers and having inlet and exhaust ports located approximately equidistantly from each other, a chest enclosing the inlet-ports, a piston fitted in the working cylinder and provided with a concetrical bore and two annular recesses in positions approximately corresponding to the relative position of the inlet and exhaust ports of the cylinder, a plug set in the bore of the piston between the two annular recesses, passages connecting the bore of the piston with the annular recesses in the body of the

piston and with the interior of the cylinder, one with that in front and the other with that in the rear of the piston, and a piston-rod journaled in one cover of the working cylinder.

638,883. DREDGER. Raymond A. Perry, Oakland, Cal., assignor of one-half to the Atlantic, Gulf & Pacific Company of West Virginia. A scow, a shaft extending transversely across its front, a sleeve turnable upon the shaft, a barrel mounted thereon and extending upwardly at right angles with the shaft, a ladder carrying the cutters and outer portion of the suction-pipe, the inner end of said ladder being supported by and movable with the barrel.

638,890. PUMP. Thomas J. Sparks, Magalia, Cal., assignor of one-half to Fannie M. Austin, San Francisco. A double-acting pump, consisting of independent heads in the form of cross-couplings, a detachable cylinder connecting one head with the other, and a pump-plunger adapted to reciprocate within said cylinder, said heads having lateral extensions, enlarged valve-chambers fitted to said



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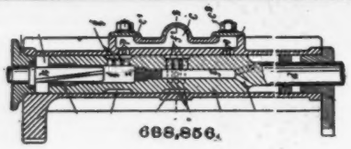

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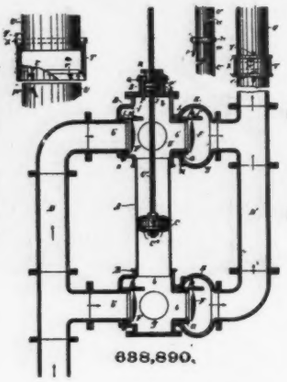


638,890.

extensions, removable valve-seats fitting said extensions, valves removable with said seats and having tail extensions projecting into the chambers, and springs within said chambers and acting against said tail extensions to quickly close the valves.

638,908. MANUFACTURE OF COMPOUND INGOTS. Sylvester A. Cosgrave, Edgewood Park, Pa., assignor to Maria B. Cosgrave, same place, and Aaron French and Margaret L. Patterson, Pittsburg, Pa. The method consists in casting a body of metal in a mold having a movable wall, promptly and progressively removing said wall from the cast metal and bringing another body of molten metal against the surface exposed by the withdrawal of the wall progressively as such exposure occurs.

638,909. MOLD FOR COMPOUND INGOTS. Sylvester A. Cosgrave, Edgewood, Park, Pa., assignor to Maria B. Cosgrave, same place, and Aaron French and Margaret L. Patterson, Pittsburg, Pa. The combination of a mold, a core having its exterior portion formed by a friable material, a supporting and removing plate at one end of the core, and means for removing the plate through the annular body of metal formed around the core.

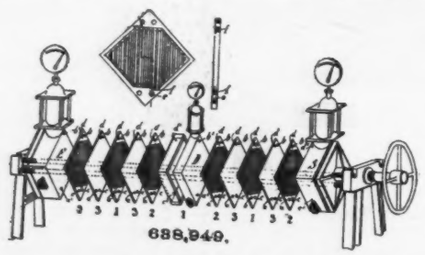
638,917. PROCESS OF PRODUCING WIRE BARS. Elisha Emerson, Providence, R. I. The process consists in forming electrically a spiral strip of metal on a cylindrical cathode, removing the strip from the cathode, winding the strip spirally with its broad sides at right angles to the axis of the spiral, mounting the spiral strip on a supporting cage or base, immersing the strip with its support to form a cathode, rotating the spiral strip and electro-depositing metal on the spiral strip.

638,926. DOUBLE-ACTING SUBMERGED PUMP. William D. Hooker, Chicago, Ill. The combination of a pump-barrel, a piston and rod for operating the same, and induction and eduction valves, of spacing projections on one side only of the barrel, and extending from either end of the pump-barrel toward each other, the ends of said projections being separated by an intervening space.

638,928. PNEUMATIC RAM. Arthur L. Humphrey, Colorado City, Colo. A pneumatic ram comprising working and return cylinders of different cross-sectional area, a double piston having its heads of different areas and fitted in the respective cylinders, a breaking tool supported independently of the piston and in the path of one of the piston heads, and a valve mechanism for admitting motive fluid directly and alternately to said cylinders.

638,938. ATTACHMENT FOR ROCK-DRILLS. Patrick H. Reardon, San Francisco, Cal. A shell provided with a pocket of two diameters, in combination with a column-clamp having a lug adapted to enter said pocket after the clamp is secured upon the column and a device opposable to the lug whereby it is secured in said pocket.

638,949. FILTER-PRESS. Gustav Ackermann, Charlottenburg, Germany, assignor to Filter and Brautechnische Maschinen-Fabrik Actien-Gesellschaft, vormals L. A. Enzinger, Worms, Germany. The



638,949.

combination with an inlet-chamber, E, gridiron-frames, filter-plates and end chamber, S, of an intermediate or collecting chamber or chambers, D.

638,961. ART OF MAKING COMPOUND INGOTS. Sylvester A. Cosgrave, Edgewood Park, Pa., assignor to Maria B. Cosgrave, same place, and Aaron French and Margaret L. Patterson, Pittsburg, Pa. Filed April 29, 1899. The method consists in casting one of the metals against a mold-wall consisting in part at least of a fluxing material, then removing the mold-wall and casting the other metal on the fluxed surface when the latter is at a welding temperature.

639,003. CONVEYOR APPARATUS. John Titus, Oyster Bay, and William Titus, North Hempstead, N. Y. The combination of a central horizontal roll having axial gudgeons projecting from its ends, inclined lateral rolls at the opposite ends of said central roll, with standards constructed with journal-boxes which receive the gudgeons, and formed with inclined journals for the lateral rolls and lubricator-channels in the standards above the gudgeon.

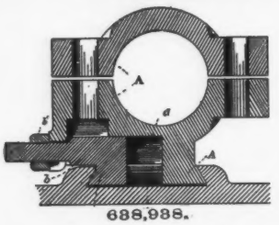
639,004. EXCAVATING APPARATUS. John Titus, Oyster Bay, and William Titus, North Hempstead, N. Y. The combination with a wheeled platform of a motor, an endless-chain excavator and mechanism to move the excavating arm on the platform.

639,005. APPARATUS FOR MAKING COMPOUND METAL INGOTS. Johan O. E. Trotz, Worcester, Mass. The combination of ingot-molds, conducting-pipe and metal bed with a fire-brick base fitted in said metal bed, having radiating channels or ducts each terminating in a chamber under each ingot-mold, a support in each chamber for the hard bloom or core to foot upon; and a clamp device, adapted to fit over the top of the mold and hard bloom or core, provided with downward-projecting lugs adapted to fit in the top of said mold and with set-screws adapted to be screwed against the hard bloom or core.

639,037. PROCESS OF MANUFACTURING BUILDING BLOCKS. Wilhelm Heimsoth and Adolf Flugge, Hanover, Germany. The process consists in recovering the mud found in the sea at the mouths of rivers and drying the same by exposure to the air, adding slaked lime in the proportion of about 5 per cent. of the mud, more or less, and river water to give the mass the consistency of paste, then adding crystallized sulphate of iron and a light substance, molding the mass into blocks and drying said blocks by exposure in the open air, after baking them at a temperature of 220° F.

639,047. AIR-ACCUMULATOR. Harvey H. Hougland, Neligh, Neb. An accumulator for compressing air comprising a series of cylinders mounted upon the spokes of the fly-wheel of an engine, piston-heads working in the said cylinders, and means connecting the interior of the pistons with a reservoir, the construction being such that the centrifugal power of the wheel may be utilized to compress air.

639,062. ELECTRO-MAGNETIC APPARATUS FOR SEPARATING ORES. Emil Kreuser, Mechernich, Germany. A pair of cylindrical electro-magnets having at least three cylindrical poles of larger diameter than the intermediate parts on which the wire coils are wound, the



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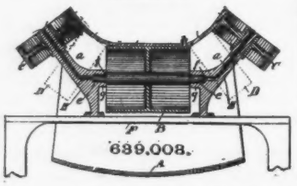

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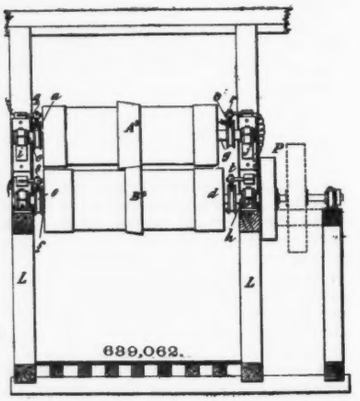
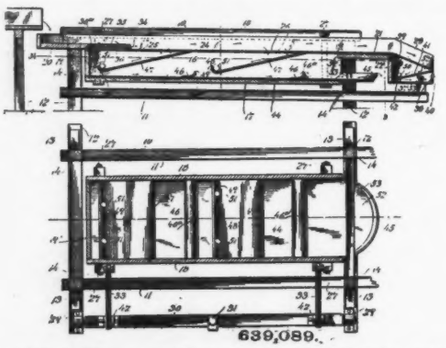


639,062.

two end poles being of the same polarity while the intermediate pole is of opposite polarity, and one of the sets of poles being made of larger diameter than the other so that such larger poles of one magnet are in contact with those of the other, while the polar distance between the smaller poles constitutes the magnetic field for the separation of the ores.

639,089. ORE SEPARATOR AND AMALGAMATOR. Isaac A. Palmer, Seattle, Wash. A suspended box provided with a grizzly perforated at intervals throughout its length, a collector-pan fixed to the box below the grizzly and provided with perforated riffles, a series of aprons within the box, below the perforated sections of the grizzly,



639,089.

and each having a perforated riffle in staggered relation to the riffles on the collector-pan, a primary screen at the head of the grizzly, a tailings-receptacle at the delivery end of the box and provided with an inclined apron and a riffle, and a discharge-screen extending from the grizzly over the tailings-receptacle.

639,090. APPARATUS FOR CHARGING MATERIALS INTO OPEN-HEARTH STEEL-MELTING FURNACES. James Powell, David Colville, Ja., John Jardine and Thomas B. Mackenzie, Motherwell, Scotland. Apparatus having in combination an endless traveling band passing around drums carried in a frame, an inclined guide at one end of the frame and adjustable guides at the other, a motor for driving the band, and a truck or carriage for carrying the apparatus.

639,130. METHOD OF MAKING METALLIC CASTINGS. William D. Allen, Huntsville, Ala. The method consists in subjecting an open-top mold or like vessel into which the metal is poured to the action of independent flames impinging on the mold at different heights, pouring the metal and successively extinguishing the flames, commencing with the lowermost, whereby the heat is withdrawn commencing at the base of the mold and continuing gradually toward the top, the heat being finally confined to the exposed molten metal.

639,145. COAL-CAR. Dennis Butler, Watson, Ill. The combination with a car having an open top, of a flexible cover attached at one end to the side of the car and comprising a series of panels constructed to alternately fold backward and forward upon each other, and a cage attached to one side of the car for the reception of the cover when the latter is folded up.

PERSONAL.

Mr. E. B. Craig, ex-treasurer of the State of Tennessee, is now treasurer of the Virginia Iron, Coal and Coke Company.

Mr. C. W. Gump succeeds Mr. H. L. Swain as superintendent of the Ibarra Mining Company at Caimalli, Lower California.

Mr. H. H. Hardinge, mining engineer of Denver, Colo., has just returned from a professional trip to New Mexico and Arizona.

Mr. H. H. Green has returned to Salt Lake City, after spending several weeks in Ohio. He is now in Idaho on a brief errand.

Mr. James H. Kinhead succeeds Mr. H. Holman as superintendent of the Best & Belcher Mining Company at Carson City, Nev.

Mr. Jno. Brockman is now manager of the Commonwealth Mining and Milling Company at Pearce, Ariz., succeeding Mr. N. S. Berray.

Mr. W. H. Kinnon, of Denver, is in charge of the copper smelter and mines of the Bromide Mining and Milling Company, near Douglas Springs, Routt County, Colo.

Mr. B. K. Bannister, general manager Utah Power Company and consulting engineer for the Payette dam and electric power project, has been at Boise, Ida.

Mr. Richard A. Parker, who has been acting as supervising engineer, becomes president of the American Zinc and Lead Mining Company, succeeding Mr. E. A. Clark.

Mr. William Kemp has been appointed superintendent of the Rosemont Copper Mines at Rosemont, Pima County, Ariz. The property is controlled by Lewisohn Brothers of New York City.

Prof. W. P. Blake, territorial geologist of Arizona, has reported that thus far none of the samples of Arizona rock submitted to him for determination as to platinum contents contain that metal.

Mr. Edwin Durant of the British America Corporation has left Rossland on a 3-months' trip to England. Mr. R. Dally Markell, Jr., performs Mr. Durant's duties during the latter's absence.

Mr. C. R. Robinson is general superintendent of the Iron and Steel Department of the Colorado Fuel and Iron Company, while Mr. J. B. McKennan is to be general superintendent of the works at Bessemer.

Mr. A. Hoffmann-Pinther, since a number of years buyer for the well-known Denver Fire Clay Company of Denver, Colo., has resigned his position and will start in business in the City of Mexico with a complete stock of assayers' supplies, chemicals, etc.

Capt. W. H. Downing, who has been with the Pittsburg & Lake Angeline Mining Company at Ishpeming, Mich., is now in charge of the Elba Mine of the Minnesota Steel Company at McKinley, Minn. His place at the Lake Angeline is filled by Capt. William Tregambo, of the East End Mine.

Mr. James W. Neill, the general superintendent of the United States Mining Company, was summoned from Salt Lake City to Boston, where he arrived before Christmas, since which time he has informed those specially interested of conditions at Bingham. Mr. Neill was one of the experts who examined these mines prior to their purchase by the United States Oil people, last March.

OBITUARY.

Erastus F. Holden of Holden & Sons, coal agents for the Delaware, Lackawanna & Western Railroad Company, at Syracuse, N. Y., died there on December 25th in his 74th year. Mr. Holden was for many years a Trustee of Syracuse University and equipped it with a handsome laboratory. A brother, E. R. Holden, is Vice-President of the Lackawanna system.

SOCIETIES AND TECHNICAL SCHOOLS.

University of Pennsylvania.—The registration for the coming year shows a total of 2,644 students, a satisfactory showing considering the higher standard of admission. The Towne Scientific School has 302 students.

Harvard University.—The total registration in all departments of the university for the current year is 4,093. The students in the college proper number 1,892, and in the Lawrence Scientific School 492. In the representative classification of States Massachusetts leads easily with 2,292 students, New York is second with 394, and Pennsylvania third with 146. There are 45 men from Canada; 5 from England; 12 from Hawaii, and 4 from Japan.

Massachusetts Institute of Technology.—In accordance with the scheme of the United States Commissioner for the Paris Exposition, by which the various colleges and universities of the country will make partial exhibits, a committee of the faculty is preparing exhibits in civil and mechanical engineering and in architectural work. Mr. Myron Fuller, assistant in geology, has got together 325 specimens of building stones from quarries all over the United States.

INDUSTRIAL NOTES.

The Lidgerwood Manufacturing Company of New York City recently sent to Mexico 2 mining hoists.

The Buffalo Forge Company of Buffalo, N. Y., reports that the demand for its down draft forges taxes the works to the utmost to supply orders.

Arrangements are under way to start the charcoal blast furnace at Newberry, Mich., which has been idle about 6 years. The charcoal furnace at Manistique, Mich., is to be repaired and started also.

H. C. Eduard Meyer, of Germany, has placed an order with the Keystone Driller Company, of Beaver Falls, Pa., for a Keystone placer testing machine to be shipped to Chemulpo, Korea, for testing gravel channels for gold.

At the Rankin works of the American Steel and Wire Company, at Rankin, Pa., recently the night turn turned out 480,500 lbs. On the day following the day turn made 503,690 lbs., equal to 225 gross tons of No. 5 rods.

The Arkansas Portland Cement Company of Texarkana, Ark., has been incorporated. The capital stock is $40,000. The officers and corporators are Thomas A. Whitmore, president; Sam Lazarus, vice-president; E. Kirby Smith, secretary and treasurer.

The Carp River blast furnace near Marquette, Mich., has been sold to the Pioneer Iron Company, now a part of the Cleveland-Cliffs Company. It is stated that the plant will be enlarged by a chemical by-product plant to make wood alcohol, acetate of lime, etc.

The firm of Wolff & Zwieker of Portland, Ore., is actively preparing to take up the manufacture of mining machinery on a large scale, including stamp mills, cars, concentrators, etc. The great activity in the mining fields of Oregon, Washington and Idaho has led the firm to try this new venture.

The Pressed Steel Car Company of Pittsburg, Pa., recently received an order from the Pittsburg & Lake Erie road for 800 steel cars of different sizes, to be finished within 4 months. The same road also placed orders with the Pittsburg Locomotive Works for 30 new engines of the consolidation type.

The Carnegie Steel Company has advanced by 7.14% the wages of all the unskilled laborers and of many of the tonnage men in all the company's plants, the Duquesne Steel Works and blast furnaces, Edgar Thomson Steel Works, furnaces and foundry, Carrie Furnaces, the Homestead Steel Works, Lucy Furnaces, Keystone Bridge Works, the Upper Union Mills and the Lower Union Mills. The advance affects 5,000 men and takes effect on January 1st. This makes a total of 25% of increase made voluntarily by the Carnegie Company since the last general wage scale was signed.

The Fort Pitt Gas Company of Pittsburg, Pa., has applied for a charter, with a capital of $2,500,000. The company merges 6 natural gas companies of the Beaver and Ohio valleys, and will construct a pipe line from Wetzel and Tyler counties, West Virginia. The companies merged are the Fort Pitt Natural Gas Company, the Rochester Light and Power Company, the New Castle Gas Company, the Independent Natural Gas Company and the Ohio Valley Gas Company. The Fort Pitt Gas Company had already absorbed the Bridgewater Natural Gas Company. The headquarters will be in Pittsburg.

The Lima Steel Casting Company of Lima, O., has bought the steel casting plant of the Lima Locomotive and Machine Company, and will operate it. The directors and officials of the new company are as follows: L. G. Neely, St. Mary's, O., president; G. W. Van Dyke, Lima, vice-president; D. E. Harlan, secretary and treasurer, and these officials with J. W. Van Dyke and J. D. S. Neely comprise the directors, and also all of the stockholders. D. E. Harlan, secretary and treasurer of the Lima Locomotive and Machine Company, and acting general manager, will fill the same position with the new company. The concern is prepared to make a specialty of mining and heavy machinery castings made from acid open hearth steel.

TRADE CATALOGUES.

The Buffalo Forge Company, of Buffalo, N. Y., issues a little 12-page pamphlet illustrating some new types of down draft forges. The 02 D type is intended for manual training schools and for all kinds of moderate work; the 0 D is designed for the heaviest work ever done in a blacksmith shop and is stated to be the heaviest and largest forge built. A down draft stationary blast heating forge is also shown.

The Westinghouse Electric and Manufacturing Company of Pittsburg, Pa., continues to revise its excellent series of illustrated catalogues and circulars with the steady progress in machine design. Catalogue No. 22 A treats of direct connected railway generators and the illustrations show some notable machines, particularly those of 1,500 K. W. furnished for a Philadelphia company. Catalogue 192 C describes belt-driven polyphase generators; No. 1001, belt-driven railway generators, and No. 1002 treats of generators and rotary converters for electrolytic work. The generators have been built as large as 810 and 850 K. W., supplying 4,500 amperes at 180 volts and 4,250 amperes at 200 volts respectively. The rotary converters shown are 126 and 175 K. W. The latter, now in use at Niagara Falls, N. Y., are supplied by 2-phase currents of 3,000 alternations per minute, at 2,200 volts. The direct-current output is stated to be 1,050 amperes at 125 to 165 volts. Catalogue No. 1003 describes direct-current engine-type generators of 125 volts and No. 1004 describes similar generators of 250 volts.

The Rand Drill Company has just issued a revised edition of its catalogue of rock drills and drill mountings for mines, quarries and tunnels, making a very attractive pamphlet of 81 pages. Four styles of the company's drills are shown each with its special merits—the "Little Giant," the "Slugger," the "New Slugger" and the "Little Terror." The last named has a valve gear which is stated to represent a combination of the best points of the "Little Giant," and "Slugger" types. The drills are to be mounted on a tripod, drifting column, shaft bar or stoping bar according to conditions. For special work Lewis hole tripods and the "acrobat" mounting are furnished. The company states that it furnishes its own drill steel, also a set of blacksmith tools for sharpening drills. Statistics showing work done by Rand drills on the Chicago Drainage Canal, with costs, are given and there are some general directions regarding running air drills; tables showing the amount of air required for different size drills and losses of pressure by friction. The catalogue will interest mining men generally.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

ALASKA.

Douglass Island.

Alaska Mexican.—The November report shows 14,204 tons ore crushed, yielding $16,036, and 222 tons sulphurets saved of a value of $6,038. Gross yield, $23,791; average of ore, $1.69 per ton. The working expenses were $18,928.

Alaska United Mine.—The November report gives 21,304 tons ore crushed, valued at $37,593, and 475 tons sulphurets saved of a value of $13,353. Gross yield, $54,615, and working expenses, $37,840. The ore averaged $2.50 per ton.

ARIZONA.

Gila County.

Black Warrior.—This company's leaching plant at its copper mines near Globe closed down recently.

Pima County.

Helvetia Copper Company.—The smelter at Helvetia is reported in operation. J. R. Cooper, formerly superintendent of the Quincy smelting plant at Hancock, Mich., is in charge.

Yuma County.

Merrimac.—The concentrator is nearly completed. There are many hundred tons on the dump of this mine at Chloride. The main shaft is down nearly 400 ft. and drifts are being worked from the 300-ft. level.

Tennessee.—This mine at Chloride is putting 200 tons of ore through the concentrator daily, and shipping about 12 carloads of concentrates weekly. The ore body is 8 ft. thick and runs

high in silver, much of it being native silver. The mine and mill are working a larger force than ever before. E. T. Loy is succeeded by J. A. Botsford as manager at the Tennessee and the old Juno. A new steam hoist is now being put in at the Juno in the 100-ft. shart. Drifting 2 ways has begun at this depth.

CALIFORNIA.

Amador County.

(From Our Special Correspondent.)

Wetmore.—At this mine near Volcano, 25 tons of rich looking rock is being taken out which will be milled as a test. The property has lain idle for many years. The China Hill tunnel, the Tunnel Company, and other placer mines in the vicinity of Volcano have plenty of water and are all in operation.

Calaveras County.

(From Our Special Correspondent.)

Calaveras Gold Mining Company.—The new hoist in course of construction by this company on their property on the Mokelumne River, north from Mokelumne Hill, is nearing completion. The vertical shaft will be continued to 500 ft. Two large turbines have been put in and the ditch has been enlarged to a capacity of 2,500 miners' inches. One wheel will drive the 10-stamp mill, rockbreakers, and concentrators, and the other an air compressor, which supplies power for the hoist and machine drills. The 5 ft. ledge mills between $4 and $5 per ton.

Ellen Vannen.—At this gravel mine in Old Woman's Gulch, men are crosscutting the head of the channel, east and west, and driving the main gangway north. Fifteen men are taking out about 50 tons of gravel per day.

Esperanza Gold Mining Company.—At a meeting of the board of directors of this company the issue of bonds to the amount of $100,000, payable June 30th, 1902, was authorized. The trust deed made to P. V. R. Ely of Boston and C. G. Burnham of New York, covers all the property. The mines are on Indian Creek, 2 miles northeast from Mokelumne Hill. The proceeds from the sale of the bonds will be used to equip the property with better buildings and machinery. The shaft, now down 1,000 ft., is to be sunk to the 1,500 ft. The mine is equipped with a 30-am. mill and a fine chlorination plant. It is a low grade proposition.

Ford.—The new vein found in the 100-ft. level of this mine, ½ mile east from San Andreas, is being followed and in a distance of 20 ft. has increased to 2 ft. The assays are said to average very high in gold. A crosscut will now be run on the 300 ft.

Kramer.—This old gravel mine, in Poorman's Gulch, is being put in working condition, under the superintendency of J. K. Carpenter, formerly of the North Star Mine. The old tunnel, which is 1,800 ft. long, is to be cleaned out and retimbered, rails put down, and air pipes installed. A mill is to be erected later.

North Star Consolidated.—This company is driving the Empire tunnel ahead to drain the large gravel channel which extends from Sport Hill and Happy Valley down the entire length of Old Woman's Gulch. This tunnel, which is about 10 ft. wide and 7½ ft. high, will tap the channel at a depth of 1,100 ft. The shaft is now down 1,040 ft. P. L. Shuman is superintendent.

El Dorado County.

(From Our Special Correspondent.)

Strahle Slate Quarries.—At these quarries at Kelsey, first quality slate is reported produced and shipped. Eighteen men are employed.

Vann.—At this mine, ¾ mile north from Georgetown, men are laying pipe and repairing the hoist preparatory to beginning development work. Pumping out the old shaft has begun.

Inyo County.

(From Our Special Correspondent.)

Kearsarge.—This old mine in Mazourka Canyon, is to be opened up. The old workings consist of about 5,000 ft. of tunnels and drifts which show large bodies of ore assaying from $5 up which could not be worked at a profit in the '60s. There is estimated to be 10,000 tons of ore on the dump which could be profitably cyanided. A plant will probably be erected in the spring.

Kern County—Randsburg District.

(From Our Special Correspondent.)

Yellow Aster.—This company has just declared a dividend of $20,000 for December; total to date, $313,789. The output has been greatly increased since the instalment of the new hoist.

At the Blackhawk and O. K. mines water was encountered in the well at a depth of 40 ft. This new supply will enable the management to increase the milling capacity.

From the Buckboard shipments are being made to Barstow.

In the new diggings about 3 miles from Cuddaback Lake, water has been struck in the well at a depth of 128 ft. Sinking will be continued until the water stops the work.

Lassen County.

(From Our Special Correspondent.)

Hayden Hill District.—The Hayden Hill Tunnel Company continues to improve its property by erecting buildings at the mouth of the tunnel. The Hayseed is crushing good ore in its 10-stamp steam power mill. The Fairplay Mining Company has completed its reservoir, and steam hoist, and work on the reduction works will begin soon.

Los Angeles County.

(From Our Special Correspondent.)

Anker Metallurgical & Furnace Company.—This company has been incorporated with a capital stock of $500,000. A smelter is in course of erection in Los Angeles. The manager, Jos. Anker, is the inventor of the process which uses crude petroleum in smelting.

Nevada County.

Allison Ranch.—At this mine in Grass Valley a new compressor has been installed and a new Riedler pump is being put in on the 950 ft. level.

(From Our Special Correspondent.)

Bullion.—At this mine, 2½ miles south from Grass Valley, an electric motor to run the pumping machinery has been installed under the supervision of W. L. Hancock, Supt. of Construction of the Nevada County Electric Power Company.

Nevada City Mine.—This property, located in Wood's Ravine, in litigation for some years, has been purchased conditionally by some of the stockholders of the Champion mine, from the lien holders.

Placer County.

(From Our Special Correspondent.)

Rawhide.—The main tunnel at this mine on Texas Ridge, about 5 miles south from Blue Canyon, is in over 1,000 ft., and the lower one has been started. The 3-stamp mill is steadily crushing. The ledge averages 3½ ft. wide.

Southern Cross.—At this mine near Towle, a 12-ft. ledge of fine ore has been cut in the main tunnel 200 ft. in. The quartz looks well and is heavily charged with arsenical pyrites. The tunnel will be continued about 100 ft., when a crosscut will be run. A tramway is to be put in.

Plumas County.

(From Our Special Correspondent.)

Plumas-Eureka.—Twenty stamps of the 60 are dropping at this mine, ½ mile west from Johnsville, and 20 men are employed in mine and mill. The water for power is brought through 4 miles of flume from Jamison Creek and delivered at the mine under 260 ft. head.

Riverside County.

(From Our Special Correspondent.)

Pasadena & Klondike Mining Company.—This company now owns 5 claims in the Mountain Beauty Mining District, near Oak Grove. The force having been increased 3 shifts will be worked running the tunnel at least 3,000 ft. The erection of a mill and a cyanide works is contemplated. F. J. Eddy is manager.

San Diego County.

(From Our Special Correspondent.)

The zinc ore recently found on the San Vicente Ranch, 6 miles from the terminus of the Cuyamaca Railway, is said to assay as high as 5% zinc. T. J. Daley is owner.

Owens.—This mine at Julian, is worked by Superintendent J. N. Large. Good ore is in sight on the 200 and 250-ft. levels.

Red Hill.—This claim in the Vallecitos District, near Poway, owned by McIlheny & Honeycut, is developed by a 100-ft. tunnel and a crosscut of 20 ft. Several other claims in the district are being prospected. The Eucalyptus shaft is down 25 ft. showing $16 ore, while on other claims base ore assaying from $3.50 to $7 is being developed.

Shasta County.

Black Spider.—This mine near Shasta is to be pumped out and reopened by San Francisco parties under the superintendency of Geo. E. Baleman.

(From Our Special Correspondent.)

Bennington.—This group of mining claims on the Mountain Copper Company's railway, 1 mile from Iron Mountain, has been sold to Bunker & Williams for $25,000. The property has been developed by 2 tunnels on the ledge which shows plenty of shipping ore. The new owners intend to drive the 2 tunnels 1,500 ft. and open the ore bodies 800 ft. from surface. Ore can be shipped to the smelter as soon as the bunkers and chutes are completed.

Sierra County.

(From Our Special Correspondent.)

Confidence.—This mine 13 miles northeast of Sonora is worked by a large force of men by the San Francisco owners. A large supply of provisions and cordwood has been stored on the premises, so that development can go on during the winter.

Diadem.—At this mine, near Forest City, owned by J. McGregor and R. B. Lewis, several good pockets have been extracted during the season. A run of 5 tons at the El Dorado Mill on Kanaka Creek is said to have yielded $5,000. Eight men are employed, under J. M. Harper.

Jumper.—On the 1,100 ft. level at this mine ¾ mile from Stent, a crosscut is being run for the vein. The 40-stamp mill is running steadily.

Keystone.—This mine, 5 miles southwest from Sierra City, has been opened again by M. H. Mead, who has let a contract to run 600 ft. on the lower or No. 4 tunnel, now in over 1,100 ft. At this point the tunnel is 1,030 ft. below the top of the ridge across which the vein courses. Three shifts will put the property in repair. The mine has the reputation of having produced very largely high grade ore.

Mammouth Springs.—Development work is going on at this drift mine, 2 miles east from Forest City. Pay gravel is being taken out, to be washed as soon as there is a supply of water. Twelve men are employed, under R. P. Mott. The property comprises 500 acres, located on a branch of Kanaka Creek.

New Lignite Mine.—A 2-compartment shaft has been opened on a seam of lignite near Colorado Springs stated to be 17 ft. thick. This lignite is delivered in Colorado Springs at $3 a ton retail. The Santa Fe railroad has a switch to the mine and has made a rate of $1 per ton to Denver.

Simminich.—The lower tunnel, 900 ft. long, at this mine at Brown's Flat, is being retimbered and opened preparatory to working the property. The various ore shoots are cut at a depth of 250 ft. from the surface.

Trinity County.

(From Our Special Correspondent.)

Brown Bear.—At this mine at Deadwood the Watt tunnel is in 2,500 ft. Work progresses at the rate of 7 ft. per day, so it will be some months before the big ore chute is tapped 1,500 ft. further in, 350 ft. below the deepest working, or a total depth of 800 ft. Some fair grade ore has been cut in stringers. The output during the past 20 years was $6,000,000. Charles Dobler is superintendent.

Tuolumne County.

(From Our Special Correspondent.)

Bonanza.—Seven hundred feet of water below the tunnel level has already been pumped out, with 900 ft. more to go. A large force is to be put at work at an early date. This property is near Sonora.

Buchanan.—Work has been suspended at this old mine, 12 miles southeast from Sonora, on account of the proximity of the old workings, a shaft down 800 ft. with numerous drifts and stopes all full of water.

Free Lance.—This mine, 12 miles from Sonora, on the Berger Branch, has developed a strong vein of ore said to assay $40 per ton. A 5-stamp mill is contracted for, and the mill building is almost completed.

Hazel Dell.—These mines, 9 miles north from Soulsbyville, are prosperous. The mill is driven by the water power system recently installed. The erection of a cyanide plant is contemplated.

Hope.—The vein in this mine, ½ mile east from Sonora, is 28 in. wide, carrying free gold and a small percentage of high grade sulphurets. Ore is being stoped out of the east and west drifts on the 300 ft. A run of 75 tons of ore milled returned $25 per ton in free gold, while the sulphurets run up into the thousands; 60 tons have been sent to the Bonanza Mill.

Spring Gulch.—This property between Big Canon and the North Fork of the Tuolumne River, 2½ miles southeast from Carters, is to be reopened on a large scale. The old shaft, which is caved, was about 400 ft. in depth. The 10-stamp mill and the hoisting plant were burned.

COLORADO.

Boulder County.

Cold Spring Tunnel and Mining Company.—The tunnel at Gold Hill is in 870 ft. The company owns 30 claims and the tunnel will cut the Cold Spring shaft on the opposite side of Gold Hill at about 2,200 ft. further. Some good ores are reported in sight in the tunnel. Illinois men are interested in the company and W. H. Combs is secretary.

Dolores County.

(From Our Special Correspondent.)

Bertha S.—M. T. Ebert will develop this and the Etna claims, on Silver Creek, during the winter with a small force.

Chestnut.—Hoskins & Weaver have opened the original Chestnut vein in a small block of ground they are working. The ore is quite high grade.

Emma.—The mill on this property has closed for the winter, but the mine will keep its usual force, the ore being stored until spring.

Chaffee County.

(From Our Special Correspondent.)

Anaconda.—This mine at Turret has a shaft down 100 ft. in good sulphide ore. A mill is to be erected.

Copper King.—A contract for sinking 50 ft. was recently let on this claim, about 3 miles north of the Sedalia. The vein averages 18 in. wide and assays 12% copper, with some gold.

Little Widow.—This claim, owned by the Wolfe Brothers, situated in Greens Gulch, Turret District, recently opened a fine body of gray copper of good value.

Clear Creek County.

(From Our Special Correspondent.)

Consolidated Stanley Mining Company.—This company at Idaho Springs is running 11 air drills on development work and employing 75 men.

Gem Extension.—W. E. Renshaw is timbering the shaft preparatory to sinking from the present depth of 600 ft. to connect with the Newhouse Tunnel at 2,400 ft.

Mammoth Tunnel Company.—This property is said to be in trouble over the debt contracted by the former management. It is located on Chicago Creek.

Massachusetts Mining Company.—This company, operating the Freeland Extension, has bought a 35-H. P. Fairbanks gasoline hoist and will sink the shaft to connect with the adit levels, the lower one at 950 ft. These levels are in the chute on which the shaft will be sunk and show 2 ft. of ore.

Perkins Tunnel Company.—A contract of 200 ft. was recently completed in driving this crosscut at Idaho Springs and another is to be let. The mineral streak is a copper ore and runs $60 a ton.

Sun & Moon Mining and Milling Company.—Sinking on the Minott lode is under way at a depth of 450 ft. The shaft will be sunk 675 ft. before starting levels. Three shifts are at work.

Gilpin County.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—H. S. Recob to R. C. Miller, ½ int. Albert lode in Enterprise District. J. B. Tinker to R. C. Miller, ½ int. Albert & Mt. Hope lodes, Enterprise Dist. F. I. Smith et al to T. H. Becker, Hunter Extension lode. C. F. Du Bois to Marie Mining & National Company, the Moneymaker lode. W. J. Keugle to A. Keugle the Cora H. lode. L. C. Beckwith to J. B. Tinker the Lexington lode. F. T. Field to T. King, et al., 260 ft. of Bobtail lode; C. K. Colvin to Boston & Denver Mining and Milling Company, the Jean lode; O. G. Andrews to B. F. George, the Little Johnnie claim; E. H. Purdy to M. Stedman, the Bonnie Belle and San Jacinto lodes; County of Gilpin to M. A. Powell, the Polly lode; G. Berglund to A. Johnson, 1/3 interest in Buck Horn lode.

Machinery Receipts.—One 100 H. P. boiler for Gold Coin Mines Company; one 80 H. P. boiler for Noteway Gold and Copper Mining Company, mill machinery for Boston & Denver Mining and Milling Company.

Light Ore Shipments.—On account of a shortage of cars shipments of ore to the smelters and outside points will be light this month.

Annex.—The New York Mining and Development Company has taken a lease and bond on this mine and have started development. H. C. Cook is manager.

Avon Gold Mining and Milling Company.—This property, now connected with the lines of Gilpin Tramway Company, is daily shipping about 30 tons to its mill on North Clear Creek and getting satisfactory returns.

Boston & Gilpin Mining Company.—The last cleanup of mill ore shows values of 6 oz. gold per cord, the tailings being worth $41 per ton. The ore came from the Gladstone Mine at a depth of about 175 ft. J. W. Holman, Central City, is manager.

Calumet Mining and Milling Company.—Daily shipments average about 40 tons to the Clear Creek County concentrating mills. This output will be increased and the smelting product may soon become a factor. J. B. Phillips, Russell Gulch, is manager.

Concrete.—A 6 by 8 friction gear hoist is being installed at 1,125 ft. in No. 2 shaft. All ore and waste material will be hoisted to that level, trammed to No. 1 shaft and handled through it. S. V. Newell, Central City, is manager.

Crown Point & Virginia.—Two pumps, one Jeanesville and one Snow, are being put in; development work has begun. W. H. Knowles, Central City, is manager.

Great North Downs Mining Company.—The shaft has been sunk to a depth of 300 ft. and crosscutting has begun. J. V. Thompson, Black Hawk, is manager.

Hayes & Wheeler Gold Mining Company.—This company has been incorporated by Atchison, Kans., parties, with $100,000 capital stock and with Jno. W. Cairus, N. S. Donald and T. M. Ashman as directors. It will work the Hayes & Wheeler mine at Quartz hill. J. W. Cairus, Central City, is manager.

Hillhouse.—C. A. Rice of Chicago has interested Kansas City, Mo., parties, who have secured a lease and bond. The machinery has been overhauled and as soon as the shaft is cleaned they will commence drifting. C. A. Rice of Russell Gulch is manager.

Topeka.—Rand drills are being installed and two 4-drill Norwalk compressors will be put in. R. E. L. Townsend, Russell Gulch, is manager.

Gunnison County.

Chloride.—This Ohio City mine is steadily shipping about 20 tons of ore weekly that is said to run $65 per ton.

Cortland.—This mine at Ohio City is reported to show a vein 6 ft. wide at a depth of 165 ft., having a pay streak 6 in. to 2 ft. wide, carrying high grade sulphides and ruby silver. The output is 50 tons of smelting ore monthly. A 25-ton concentrating plant is proposed. About 15 men are busy under S. J. Grant, manager.

Ouray County.

(From Our Special Correspondent.)

Atlas Mining Company.—This company, in the Sneffels District, is shipping occasional lots of very rich tellurides.

Bachelor.—The ore bodies at this Ouray mine are larger than ever. The shaft from the upper level has been in ore from the start. About 3 carloads per week is the output. The mill is running on the dump with 6 Bartlett tables, and will probably add 2 Wilfleys soon. Its capacity now is 100 tons daily.

Black Girl.—This property, owned by Chas. Hinckel of Pueblo, is worked under a 3 years' lease by Hagerty, et al. The first class shipments average 3 carloads monthly, besides several hundred tons of second class ore which were concentrated and shipped during the summer to the Philadelphia Smelter at Pueblo at a neat profit.

Bright Diamond.—Griffith Brothers are working this property north of Ouray under lease, and are shipping a carload per month of gold bearing iron pyrites.

Camp Bird Mines.—The output continues to be a carload of concentrates daily, the entire mine product going through the mill. A lead mill is also being constructed. The big boarding house is completed and the force is being enlarged daily.

Grey Eagle.—W. H. Strout has secured a lease and bond on this property and is taking out some high grade ore. The claim is located almost within the northern limits of Ouray.

Hawkeye.—A 600 ft. tunnel is being driven to cut the famout Bimetallist vein in Sneffells District, which will open up 1,200 ft. of stoping ground. Operations on the Bimetallist have been suspended, pending the completion of the tunnel, about March 1st.

Newsboy.—This property, north of Ouray, is worked by M. S. Corbett with a force of 20 men. Two carloads of first class ore per week is the output, and about 10 tons daily of second class is stored for future milling.

Queen of the West.—This property, which has been idle since 1892, was leased recently to a party of local miners, who struck a small vein of very rich ore in the upper quartzite almost at grass roots. A 300 ft. crosscut is being driven to cut the vein at greater depth.

Park County.

Golden Fleece.—At the new concentrating plant at this mine, 2½ miles from Lake City, things are working smoothly. From the ore bins the ore is dropped on a table with ½-in. mesh, the fine ore going direct to the rolls and the coarse to the crusher. A belt conveyor, serving as a picking table, takes the crushed ore to the rolls, of which there are 3 sets. The screens are 4, 8, 10 and 16 mesh. From the screens the ore goes to the 4 jigs, 3 double and 1 single. The single jig takes the 10-mesh concentrates. After jigging the ore is re-sized and run over 3 Wilfley tables; from there it goes over Frue vanners, thence to the slimer, and then to the settling tank. Power is furnished by a 100-H. P. Hamilton Corliss engine.

Routt County.

(From Our Special Correspondent.)

At Douglas Springs is a partially developed copper district, as yet little known to the mining world. The country is broken and hilly, the formation is sandstone traversed by a belt of lime from 300 yds. to 2 miles wide, running east and west. The district has been pretty thoroughly prospected and there are a number of claims on which more or less development work has been done, the ore being oxides and carbonates.

The most important property is that of the Bromide Mining and Milling Company, on which, under the management of W. H. Kinnon of Denver, a 36-in. water jacket furnace is now smelting 18 tons per day of ore said to go 15% to 20% copper ore. Mr. Kinnon is also making improvements at the company's mines.

San Juan County.

(From Our Special Correspondent.)

Copper Belle.—A small force is busy under Grant Nelson, repairing ground in the crosscut, following which the 400 ft. tunnel will be continued 100 ft. to cut the principal lead.

Empire Consolidated.—Machine drills have been put in, and numerous leads cut by the big tunnel will be developed. The mill is being overhauled.

Fourth of July.—A big streak of lead ore with high silver values has been opened in this claim on Boulder Mountain.

Gold King.—Although 40 stamps are constantly dropping, arrangements are being made to add 40 more by March 1st. This company recently purchased the Sampson Mine and will soon start the Sampson Mill, which is being repaired.

Grand View.—This property, owned by Phillips et al, shows a large body of silver-bearing lead ore. A crosscut is to cut the vein at a point 120 ft. from the present workings and 300 ft. deep.

Grub Stake Pool.—This is a new company, organized to cut through Red Mountain, making a cheap outlet for the ore from several valuable claims on the east side of the Mountain. Sherer et al, who have the contract, have already made considerable headway.

Kendrick Promotion Company.—This company is developing the Henrietta and Mineral King properties in Prospect Basin. A streak of lead ore has been encountered in No. 2 level.

Paradox Copper and Gold Mining Company.—A 6-in. streak of solid gray copper ore has been disclosed at the Henrietta in the lower level.

San Miguel County.

(From Our Special Correspondent.)

Alta.—This property at the head of Gold King Basin, N. T. Mansfield of Telluride, manager, is forging to the front. The owners have men busy on development, shipping the ore taken out, and there are 2 sets of leasers making regular shipments to the smelters. The ore is the highest in lead in the county; the silver values are high, but the gold values are small. It nets from $400 to $900 per car. The vein is from 2 to 5 ft. wide, of either shipping or milling ore. Frank W. Graham of London, one of the owners, has taken a lease on the dump, low grade ore. He has built a bucket tramway to the Gold King 40-stamp mill where 10 stams have been leased, and is getting a fine product from concentrating machinery put in behind the stamps.

San Juan Gold Mining Company.—State Senator W. S. Buckley, manager, last summer started converting the company's mill in Gold King Basin near Telluride into a cyanide plant. The mill will be soon one of the most complete cyanide plants in the State, with a normal capacity of 200 tons in 24 hours, which can be largely increased. Forty to fifty men have been developing the Bessie group, which is in condition for a large output. A Finlayson tramway, something over 4,000 ft. long, is to connect the group and mill, and is nearly completed.

Teller County—Cripple Creek.

(From Our Special Correspondent.)

New Railroad.—There no longer seems to be any doubt that the road from Colorado Springs to this camp will speedily be constructed. It is understood that the grading for the first divisions has been let and that work will begin right away. A number of prominent Colorado Spring mine owners are back of the enterprise, including Irving Howbert, E. W. Giddings, Jr., Mr. Woods of the Woods Investment Company, J. F. Burns and others.

Acacia Gold Mines Company.—A fair-sized body of rich ore has been struck in the west drift of the 6th level on the Burns claim, worked by Messrs. Brady and McGill of Victor, under lease. Considerable ore has been taken from this property of late. The claim is situated on Bull Hill and adjoins the Pharmacist.

Gold Coin.—This company recently declared an extra dividend, making $100,000, to be distributed among the stockholders. This is certainly a very good showing, since it is but a few months that the company sustained heavy losses in the Victor fire. The treasury reserve is still very heavy, though the exact amount is not known.

Gold Knob Company.—The control has passed from D. H. Moffat of Denver to a syndicate composed of Colorado Springs men. Among those interested are J. F. Burns, I. W. Bonbright, J. R. McKinnie, F. G. Peck, F. M. Woods and others. Besides these gentlemen, Messrs. Eben and Syl Smith are interested. The ground comprises a large amount of property in and adjoining the townsite of Goldfield, close to the Portland, the Lillie, Vindicator, Golden Cycle and other properties. The new company will be called the Gold Knob Mining and Townsite Company.

IDAHO.

Blaine County.

Big Copper Basin.—Four claims of a 16-claim group in this basin, 37 miles from Ketchum, are reported bonded to H. C. Stratton et al, of Portland, Ore., for a large sum. A. J. Crook, promoter of the transaction, will act as manager. A smelter will be erected. About 15 men are to be kept at development work during the winter.

Red Cloud.—Thomas Kenelly and associates are to work at least 15 men on this property near Hailey during the winter. The mill will not shut down.

Boise County.

Boston & Idaho Gold Mining Company.—R. D. Brown is reported to be working for this company at Pearl. He is crosscutting on the Silver Spray claim and drifting on the Black Bear.

Checkmate.—The company's 5-stamp mill at Pearl is crushing 24 tons per day, producing 5 tons of concentrates. The mill is built for 10 stamps—shafting, pulleys, Wilfley tables, battery frame and power ready for the other 5-stamps. The power is a 28 H. P. gasoline engine. Six miners supply the mill with ore.

Lincoln.—This property at Pearl, belonging to W. P. Carter and J. D. Bloomfield of Nampa, shows 2 veins about 5 ft. wide each carrying a narrow pay streak showing good values.

More Creek Placers.—The bedrock flume on More Creek, 10 miles below Idaho City, is finished. It is 16 ft. wide, 5 ft. deep and 1,800 ft. long.

Payette Mining Company.—This company has been organized in Washington with its headquarters at Walla Walla. The capital stock is 1,000,000 shares, par value 1c. R. H. Johnson, D. Miller, J. I. Yeend, Mr. Toner and A. Marchoit are directors. The company will develop the Dollar claim at Pearl.

Idaho County.

Vesuvius.—Clark & Sweeney of Spokane, it is said, have bought this group of claims in Buffalo Hump District for $20,000 from N. B. Pettibone, John Matheson, and J. M. Shiffler.

Shoshone County.

Ore Output.—Owing to the prolonged shutdown of many mines following the riots of last April, the ore production for the year will show a falling off as compared with 1898. However, the mines are now working with full forces and the present output is said to be 15,000 tons of shipping ore or 100,000 tons of crude ore monthly.

Silver King.—The new mill at Kellog is running. The water supply is rather short.

IOWA.

Allamakee County.

Waukon Iron Ores.—The iron ores near Waukon that the Federal Steel Company has been investigating have been long known, but have been little worked on account of their being non-Bessemer and unable to stand high freight charges. According to Assistant State Geologist H. Foster Bain, the ore is well suited for foundry purposes. It contains over 54% iron, but goes as high as 0.30% in phosphorus.

KANSAS.

At La Harpe, 5 miles east of Iola, on December 21st, fire destroyed two-thirds of the Lanyon Zinc Company's plant, causing a loss estimated at $50,000, fully insured.

Two workmen were crushed to death by a falling smokestack. The plant, which was one of the most extensive of its kind in the world, will be rebuilt at once. It was one of the 4 plants worked by the Lanyou Company, 2 being at Pittsburg and another at Iola.

MICHIGAN.

Copper.

Norwich.—At this old property in Ontonagon county, the most westerly on the range, 9 miles west of the Victoria and 11 miles west of Rockland, about 15 men are busy. The mine had not been worked since 1867, when A. P. Meads of Marquette took hold of it last May. Extensive repairs have been made to the 475 ft. tunnel. Boilers, engine and pumps have been put in.

Oneida Copper Company.—This company, recently incorporated under Maine laws with 100,000 shares of $25 each, controls 22,000 acres of mineral and timber land in Keweenaw County, covering what has been owned at various times by the Delaware, the Pawnee and the Conglomerate companies. The property has a hoisting plant and a stamp mill with 3 heads, situated at Lac La Belle, 7 miles distant. There is also a 50-drill compressor. The property has been idle 16 years, the attempt to work the Alluez conglomerate being a failure. The new concern has had 25 men under Superintendent W. R. Vivian working all the fall, locating the Kearsage lode, and it is claimed that the search has been successful. The president of the company is C. H. Palmer of Boston, and the directors are Charles W. Trotter of Philadelphia, J. E. Gillingham of Philadelphia, Edwin Henwood of Hancock, C. H. Palmer, and another Boston man.

Iron—Marquette Range.

Though Lake shipments closed later than usual and a lot of ore went forward late in the season, there is no let-up in activity at the mines. Stockpiles this winter will be bigger than ever.

Beaumont.—This mine, at 3 miles west of Michigamme, of which John Thoney of Marquette is principal owner, is to be reopened after many years of idleness.

Foxdale.—This mine at Humboldt has been reopened by Messrs. Dyer & Buzzo of Crystal Falls. The shaft is down 225 ft. and a lens of 65% iron ore 25 ft. thick is reported opened. Richard Christian is mining captain.

Kloman.—It is stated that this old mine, west of Republic, may be opened again.

Riverside.—A new engine house is building at this mine, west of Republic, that has lain idle 10 years, and the mine will be opened again.

MINNESOTA.

(From Our Special Correspondent.)

Double track construction is progressing along the line of the Duluth and Iron Range road, and by spring most of the line between the docks and the Mesabi branch will be doubled. It is hoped to drive a tunnel some time through the granite crest of the Mesabi range, to reduce grades for ore coming from Tower and Ely.

Several of its 100,000-lb. cars have been received by the Duluth, Messabe & Northern road, too late to be tested this fall. These cars are 9.5 ft. high. The road is lengthening its side tracks and improving its branches from the main line junction to the mines. On the dock approach stone piers are being built at crossings and the track, 30 ft. above ground, will be filled solid. Work on No. 3 dock has started.

Iron—Mesabi Range.

(From Our Special Correspondent.)

Explorations.—Messrs. Merritt and Palmer are exploring just south of the Mountain Iron Mine in T. 58 R. 18, and have several pits in excellent ore. Other interests have ore close by. Just east of the Mountain Iron, Messrs. Miller and Brown have pits and drills down in ore. Within a radius of 1 mile south and 2 or 3 miles west of Mountain Iron several other explorations are under way. E. J. Longyear is drilling beside the Merritt exploration. In T. 58 R. 19 there is much work going on in locations explored several years ago but deserted since. The Minnesota Iron Company has bought a large body of lands containing ore, in sections 17, 19, 20. Across the entire width of T. 58 R. 20, through sections 24, 23, 22, 21, 27, 28, 29, 32, 31 and 30, work is under way or has been recently in progress. West of Hibbing there are also many explorations under way, and a large body of ore has been found in T. 57 R. 21, belonging to J. J. Hill and under lease to Bennett & Longyear. This discovery is not recent. Far to the east some work is under way, in T. 59 R. 15, and T. 59 R. 14. The results of this work are not determined.

Explorations are under way on a large scale in the western portion of T. 58, R. 18, and some excellent ore is being shown.

Explorations are under way by Miller & Brown in section 3, T. 58, R. 18, where S. F. Sniveley found ore 8 years ago. Miller & Brown have over 100 ft. of ore.

Adams Iron Company.—The ore body is larger than was supposed in the early days, and 2 new shafts will be sunk this winter, one north and west of No. 1 and the second south and east of it. These will be No. 4 and No. 5 shafts. No. 5 will be sunk for the first few feet through an old stripping dump, made when it was supposed there was no ore in that part of the company's ground. Besides hoisting 700,000 tons of ore, a magnificent new steel shaft-house, the first of its kind in Minnesota, has been erected at No. 3, new boiler and engine houses between Nos. 2 and 4, and a 6-ft. drum and air compressor will be installed. Eight or 10 acres are being cleared and levelled for a new stockpile ground. Indications are that Adams another year will be in the list of those mines that can produce 1,000,000 tons of ore. About 575 men are now employed, and this force will be at work all winter.

Auburn Iron Company.—This company is stripping an extension to its present pit, from which 1,400,000 tons of ore have been taken. The shaft will be deepened and a new level opened to be mined by milling and a steam shovel in the pit. The mine will also open a new pit east of the track, where there is 50 to 60 ft. of stripping, which will be removed by milling. Depths that would have appaled early operators are undertaken on account of the increased expense of underground labor, the scarcity of men and the greater efficiency of machines. Auburn is likely to produce 500,000 tons next year.

Minnesota Iron Company.—This company is preparing for very heavy output next year at Genoa and Elba mines. These mines produce a high grade ore in much demand. Capt. Downing, late of the Pittsburg & Lake Angeline Company, is superintendent of the Elba, and A. P. Silliman, at one time of the Mountain Iron, but lately with the Oliver Company at Iron River, Mich., is mining engineer at both properties.

MONTANA.

Silver Bow County.

Anaconda Copper Company.—The new matte furnaces at the lower smelter at Anaconda are respectively 31, 32 and 45 ft. long and 14 ft. wide inside. The smaller furnace produces about 50 tons of matte in 25 hours. The 23 small furnaces each produce about 12 tons in 24 hours, and the total output of matte is 200 tons in the same time. Changes are contemplated by which the matte will be conveyed to the converters while still molten instead of in pigs as now. The concentrates are roasted in 96 Bruckner furnaces each 18 by 10 ft., carrying 14 tons at a charge.

NEVADA.

Elko County.

Baltimore.—This group of 6 claims on Lone Mountain, near Elko, is now controlled by S. J. Weston. Recent explorations are reported to have shown some old workings believed to date back to the days of Spanish rule. Regular shipments of ore to Salt Lake City are reported to go 18% copper, 11 oz. silver and $1.75 gold per ton. A vein of malachite is reported opened recently.

Humboldt County.

(From Our Special Correspondent.)

Copper Prospects.—North and south of the Adelaide at Golconda surface prospects and several grubstakes have been made by gophering out and selling the ore to the Glasgow & Western Smelter, which exacts a low treatment charge and pays Salt Lake prices for copper, gold and silver. This saving of railroad freight in some instances represents the entire profit.

Colossus Copper Development Company.—This successor of the Granite Creek Development Company is exploring an extensive copper area 22 miles north of Golconda. It is a Chicago undertaking. Morton Lindley is president-manager and Fred Chapman is general superintendent. Eighteen men are working and some encouraging values are said to be found.

Storey County—Comstock Lode.

Andes Mining Company.—At the annual meeting the representation of stock amounted to 96,580 shares out of 100,000 shares in the mine. The following directors were elected: Nat T. Messer, E. L. Parker, William Edwards, George C. Sneider and Herman Zadig. Nat T. Messer was chosen president, E. L. Parker vice-president, John W. Twiggs secretary, and Joseph R. Ryan superintendent. The company had $3,083 on hand December 1st, 1899.

Gould & Curry Mining Company.—At the annual meeting, 104,434 shares of the 108,000 shares of stock were represented and the following directors were elected: Charles H. Fish, H. Zadig, E. Gauthier, Nat T. Messer, A. S. Wollberg, A. F. Coffin and A. K. Dubrow. H. Zadig was elected president, Charles H. Fish vice-president, A. K. Dubrow secretary, and James H. Kinkead superintendent in place of H. Holman. The company had a balance of $468 on hand December 1st, 1899.

Mount Diablo Mill and Mining Company.—At the annual meeting 9,620 shares of the 15,059 shares of outstanding stock were represented, the balance (34,941 shares) of the 50,000 shares of capital stock being in the company's treasury. Directors were elected as follows: John Tonningsen, John McCarthy, R. W. Heath, J. B. Bourne and D. H. Whittemore. John Tonningsen was elected president, John McCarthy vice-president and R. W. Heath secretary.

NEW MEXICO.

Colfax County.

Blue Bandana.—M. Cauley is developing this group of 6 claims. Two Huntington mills with Frue vanners and Woodbury tables will treat the ores.

Montezuma.—This corporation is running its 20-ton mill steadily on ore from the Glasner group.

Ohio Gold Mining Company.—This company is pushing work at Elizabethtown and on the Denver claim on Iron Mountain, has a shaft down 175 ft. on a 6 ft. vein running from $10 to $19 gold. On the main ridge near Baldy Mountain the company is developing a group of 3 claims by tunnels. One tunnel now in over 300 ft., is expected to cut a 5-ft. vein at a depth of 300 ft. in about 200 ft. further. Michael Walsh is general manager.

Grant County.

Colorado Fuel and Iron Company.—The company continues to ship a train-load of iron daily to Pueblo from its mines at Hanover.

Lincoln County.

Capitan Iron Company.—This company owns 10 claims 3 miles east of Capitan, showing iron ore that is stated to run as high as 64% iron. J. A. Haley and E. W. Parker have leased a con-

trolling interest and have men at work. Ore will be shipped to El Paso, or if this proves too expensive, a blast furnace may be built.

Sierra County.

Bobtail.—This mine at Hillsboro, idle for 10 years, has been pumped out and is being worked.

Trippe.—This Hillsboro mine is shipping 80 tons of ore monthly to smelters, which is stated to net $75 per ton. The mill ore runs about $25. The mine is owned by Pennsylvania parties and 30 men are employed.

NORTH CAROLINA.

Davidson County.

(From Our Special Correspondent.)

Silver Hill.—Of late some native silver has been taken out with other ores and shipped to England via Wilmington. It is reported that the last lot of native silver weighed about 50 lbs. The mine is worked by the West Prussian Mining Company, Limited, under the management of Edward Hopkins.

Gaston County.

(From Our Special Correspondent.)

Bessemer City.—These iron mines are in full operation with air drills. General Manager Lawton has returned from upper Michigan with a gang of experienced drill men and will get out ore as fast as possible.

Montgomery County.

(From Our Special Correspondent.)

Salisbury Granite and Construction Company.—This company has purchased and paid for the Stone Mountain and Hambley Granite quarries. Modern machinery is being purchased and 100 men put to work at once. Work sheds and dwelling houses have been contracted for. Col. E. B. C. Hambley of Salisbury, N. C., is general manager.

Tebe Saunders.—Large stamp pumps are in place on the Uwharrie River pumping water to sluice the auriferous surface and increase the veins. The rich ore is in pockets, one of which yielded over $20,000 some years ago.

NORTH DAKOTA.

Burleigh County.

Alexander Menke of New York City, with J. Moersch and Herman Wolf, have been in Bismarck, N. D., experimenting on Dakota lignites. Dr. Wolf is the inventor of a process by which it is claimed lignite can be made into a good fuel at a profit.

OREGON.

Lane County.

(From Our Special Correspondent.)

Bohemia District.—Considerable attention is paid to this district, 150 miles south of Portland and 34 miles east of Cottage Grove, on the California & Oregon Railroad. The Musick group has nearly 3,000 ft. of tunnel work and a 10-stamp mill in operation, which handles about 20 tons daily, netting about $5 on the plates, besides making 1½ tons of concentrates by the Wilfley tables. The smelter product is shipped to Tacoma and averages $60 in value. At the Noonday group, 1½ miles distant, is a 20-stamp mill and a Bleichert tramway. In the vicinity is the Helena group, where there is quite a body of ore. The ore is mostly decomposed quartz, but sulphurets are found at about 400 ft. below the surface. The London Exploration Company recently purchased property on Champion Creek and a Boston man has invested in the Vesuvius group for an English syndicate.

PENNSYLVANIA.

Anthracite Coal.

The Hampton and Hyde Park collieries of the Delaware, Lackawanna & Western Company at Scranton shut down by reason of a strike of the driver boys, who assert they are working 10 hours for the same pay they got in dull times, when they were required to work only 8 hours. Twelve hundred men are made idle.

Duryea.—Because the Connell Company refused to discharge 8 non-union men, 1,000 hands employed at the Duryea Colliery quit work.

Bituminous Coal.

Braznell.—The most serious mine explosion in the history of the coke region occurred at these mines near Uniontown on December 23d. The explosion is thought to have been due to a sudden accumulation of gas, but all indications are that it was in large part due to coal dust. The force was terrific, wrecking the building and tipple at the shaft head and greatly damaging the workings. About 60 men were below ground and 32 are reported killed. Most of the men are Hungarians. The mine is a new one.

Mansfield Coal and Coke Company.—The Pittsburg Coal Company has purchased the mining property of the Mansfield Coal and Coke Company, with the exception of one mine at Walker's Mills, including the 1,300 acres of coal land recently acquired by the Mansfield Company in the Pan Handle field, and also the charter of the proposed new railroad to be called the Griggs & Montour Railroad.

The Pittsburg Company has also secured control of the three-fourths interest of L. Curry and C. Morris in the Vulcan Mine, which has been operated by the Cuddy-Mullen Coal Company.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Carr.—This mine, on Lightning Creek, which showed such a rich streak of ore last summer, has gone back into the hands of the owners, after several companies had tried to work it.

Lawrence County.

(From Our Special Correspondent.)

Baltimore & Deadwood.—This company has made its first cleanup since it started work with 20 stamps and is treating about 90 tons of ore per day. The mine is at Gayville.

Belle Eldredge.—Ore is shipped from this mine, in Spruce Gulch, to the smelter.

Golden Reward Company.—This company has completed the reverberatory furnace at the smelter for treating slag.

Kicking Horse.—Work has been suspended in this mine, at the head of Blacktail Gulch, owing to a flow of water. New pumps will be put in. The mine has been shipping about 75 tons of ore daily to the old cyanide plant in Deadwood.

Spearfish Cyanide Plant.—F. M. Wall, one of the principal mine operators in the Ragged Top District, has bought the cyanide plant at Spearfish and will treat ore from the Balmoral claims, in Ragged Top District. Soren Jensen, formerly chemist at the Golden Reward Chlorination Works, will be chemist.

Sunset Mining and Reduction Company.—This company has been working in the Bald Mountain district over a year. Its capitalized stock is $1,000,000; par value of shares, $100. A shaft has been sunk 315 ft. within 75 ft. of the north line of the company's ground, to Cambrian quartzite, where a crosscut has been run 1,700 ft. clear across the ground. In this crosscut 2 metamorphosed zones were passed through. East of the shaft there is a zone 200 ft. wide, supposed to be a continuation of ore bodies, worked to the north. The Tornado shoot, which is furnishing ore for the Golden Reward Company, is believed to have been cut west of the shaft. Neither of the zones carry ore rich enough to mine profitably where cut. The plant is fitted with 260 H. P. Economic boiler, one 100 H. P. Minneapolis boiler, a double 4 ft. drum, a Flory hoisting engine which operates 2 cages in a 3-compartment shaft, and a Prescott duplex sinking pump, capacity, 500 gals. per minute. The company has 13 claims and some fraction, in all about 100 acres. On the north it is bounded by the properties of the Golden Reward and the Horseshoe companies. The Delaware shaft of the Golden Reward Company is 1,500 ft. south of the south line of the Sunset ground. New officers were recently elected and the control of the Sunset company has practically passed to Milwaukee parties. F. Clemens Smith of Deadwood is general superintendent.

Two Johns.—Minneapolis parties are negotiating for this mine, located at the head of Squaw Creek, owned by the Two Johns Mining Company of Chicago. The mine shows fair grade ore, opened by several thousand feet of tunnels and drifts.

Wasp No. 2.—Regular shipments are being made to the smelter in Deadwood.

Pennington County.

(From Our Special Correspondent.)

Highland.—William Hall, of Colorado Springs, Colo., has been working this mine and mill in Jenney's Gulch, 5 miles east of Mystic. Ore is being broken from an 18-ft. ledge. There are 10 claims in the group and several rich veins and shoots of ore have been opened. Five stamps will be worked for a time. J. T. Galagher, of Cripple Creek, is amalgamator.

Uncle Sam Company.—The stamp mill of this company has started work. It has been thoroughly repaired. A shaft is being sunk 100 ft., at the bottem of which a drift will be run to catch an incline. The mine is in the Elk Creek Mining District.

Mystic Cyanide Plant.—Work on this new 100 ton plant, being erected by F. Ford of Chicago, progresses. It will be ready in about 30 days.

TENNESSEE.

Maury County.

Phosphate Industry.—Bad weather and limited car facilities interferes with regular shipments. The Tennessee Phosphate Company's new plant at Mt. Pleasant has been completed, and turns out rock under 3% iron and alumina. The Mt. Pleasant Southern Railway has laid track nearly up to the plant of the American Phosphate Company. The Webb Ridley farm north of Mt. Pleasant will be worked by the Ridley Phosphate Company, recently organized.

TEXAS.

Hardeman County.

Gypsum Lands.—W. J. Jones of Quanah has, it is stated, sold to A. Henley, vice-president of the American Cement and Plaster Company, 4,000 acres of land, 2 to 5 miles northwest of Quanah, on which plaster-of-paris and wall plaster mills may be erected. The American Cement and Plaster Company has also bought and is running the mills and property of the Texas Plaster Company near Quanah.

UTAH.

(From Our Special Correspondent.)

Bullion and Ore Shipments.—During the week ending December 23d there were sent forward from the different smelters 20 cars, or 844,618 lbs. lead-silver bullion; 3 cars, or 162,516 lbs. copper bullion. In the same week there were shipped from the different camps 45 cars, or 1,936,630 lbs. lead-silver ore, which went to smelters outside of the State for treatment.

Smelter Stocks.—The year will end with an unusually large supply of copper matte, ore, and concentrate products on hand at smelters; the aggregate will be not far from $1,000,000. This material, mined in 1899, will figure in Utah's metal production of 1900.

Carbon County.

(From Our Special Correspondent.)

Pleasant Valley Coal Company.—November's coal production was 95,000 short tons, of which Winter Quarters mines supplied 45,000, Castle Gate 30,000, and Clear Creek 20,000 tons. November's coke output was 24,300 tons, making, all told, a new month's top record. The coal production for the first half of December is 50,600 tons and this yield is to be further increased. At Winter Quarters there are 3 mines, Nos. 1, 2 and 4, where over $100,000 were spent in betterments in 1899. Clear Creek is a new mine, 7 miles from Scofield, from which point a railroad was built since July last and began producing coal in November. Improvements here the past year cost $100,000. At Clear Creek is a mammoth seam of pure coal 14 ft. thick. At Castle Gate operations in 1899 were on a generous scale and about $40,000 was spent in betterments. Total tons of coal marketed during the year will be about 800,000 tons; coke sold, 26,700 tons.

Juab County.

(From Our Special Correspondent.)

Tintic Shipments.—In the week of December 23d there were sent forward from the 3 railroad points of the district 113 cars of ore and 3 cars of concentrates, credited to the following mines; Centennial-Eureka, 28 cars ore; Mammoth, 16 cars ore, 3 cars concentrates; Gemini, 12 cars ore; Swansea, 12 cars; Bullion Beck, 10 cars; Godiva, 6 cars; Uncle Sam, 6 cars; Grand Central, 4 cars; Sunbeam, 2 cars; South Swansea, 1 car; Tesora, 1 car; Tintic Iron, 15 cars hematite for flux.

Eagle-Blue Bell—On December 23d a find of bonanza gold rock was made on 250 level, from which the first sample returned $1,200 per ton. Manager McChrystal is enthusiastic.

Four Aces-South Swansea.—For needs of pending litigation it is agreed out of court that plaintiff and defendant will accord every facility for underground examination. O. P. Palmer will head the experts for Four Aces and J. W. Neill for South Swansea.

Hero Mining Company.—Capitalization, $500,000 in $1 shares, with $200,000 set apart for treasury needs. Officers and directors are: T. A. Sloan, president; H. B. Cole, vice-president; W. H. Child, secretary-treasurer; F. Wach, C. H. Knox and C. T. Bridges. The realty consists of Dewey Nos. 1, 2 and 3 lode claims south of R| G. W. Mine.

May Day.—A steam hoist and power drills are in commission. The new buildings will be finished by New Year's.

New Erie.—Tunnel is being driven on the ledge of this West Tintic property, thus far without any special ore uncovering. W. D. Bogan is in charge.

South Swansea.—President Wheeler says the court's restraining order about ore shipments, due to Four Aces suit, does not stop production, as considerable of the mine is not affected thereby.

Star Consolidated.—Mine is to be closed from December 23d to January 2d, when E. P. Jennings will become superintendent.

Utah-Sioux.—General Manager Robert D. Grant, who has spent 2 days in Tintic, expects the Farrel mill will soon begin work on the company's low grades. Samuel Oliver, formerly master mechanic at Parrot mines, Butte, is overhauling the mill.

Salt Lake County.

(From Our Special Correspondent.)

Morning Star Group.—Word is received from Mr. J. S. Kennedy that he will fulfil the conditions of the option on the Morning Star group southwest of the Highland Boy. The property was sold in Boston prior to the recent panic and it is learned the deal will hold. It is believed the Highland Boy ledge passes through this tract.

San Pete County.

(From Our Special Correspondent.)

Sterling Coal and Coke Company.—For 1899 the total coal production was 5,000 tons. The

main tunnel is in 2,260 ft. and it is anticipated that a thicker coal seam will soon be cut. Seam now mined averages 30 in. Company supplies the San Pete Valley Railroad and some local needs.

Summit County.

(From Our Special Correspondent.)

Daly-West.—It is said the several lots of ore recently settled for through the valley samplers returned about $2 per ton less than like products sampled at Park City. Verily, the miner pays the freight.

Marsac Mill.—It will hardly be possible to run the year out on Ontario tails, as the dump is frozen. However, the mill will probably not be long idle, as Superintendent Chambers plans to start on Ontario ore. The tonnage will be reduced, for the 30 stamps cannot handle over 60 tons daily, but the values recovered will be more than from 100 tons of tails.

Park City Shipments.—In the week of December 23 there were marketed through the Mackintosh sampler 3,046,935 lbs. of smelter products credited as follows: Daly-West, crude, 1,450,320 lbs.; concentrates, 365,110 lbs. Silver King, crude, 708,360 lbs.; Anchor, concentrates, 410,005 lbs.; Apex, concentrates, 113,140 lbs. The Daly-West crude products, though shipped through the Mackintosh sampler, were sampled by the valley samplers, the lots being divided between the Taylor & Brunton and Conklin plants.

Tooele County.

(From Our Special Correspondent.)

Daisy.—Manager Chan Gardenier reports the mill handling 100 tons daily, and expects that 400 tons will be put through each 24 hours soon. A 200-lb. lot of cyaniding product, representing a 17 day run, has just been sent out. The gross gold yield for 1899 is nearly $75,000.

Geyser-Marion.—From first to last, 1899 has been full of discouragement. Several times it seemed that exploration was on the point of opening extensive ore reserves, only to have hopes dashed. Total production for the year was about $120,000.

Mercur.—Gross production for past 12 months is under 24,000 oz. gold and dividend paid $100,000, though a quarterly $50,000 dividend is promised next month. Dividends in 1898 aggregated $355,000, of which total $175,000 was not earned through operating mines and mill. This year a much larger ore tonnage has been treated, of reported better grade, yet the total earned dividends are less than the prior year. Mr. Dern understands why, but Eastern shareholders do not.

Ophir.—New mill building is all enclosed and ready for the machinery. The pipe line is being put in to supply mine and mill with water. A large force is employed on the surface and under ground new ore reserves are being blocked out. Ophir will make a considerable contribution to Senator W. A. Clark's income for 1900.

Uinta County.

(From Our Special Correspondent.)

Uinta Copper Summit Company.—The Dyer mine and smelter has closed for the winter. An effort was made to haul coke from Price, on the Rio Grande Western, but satisfactory rates were not obtainable. It is almost impossible to keep the road open to Carter, in Wyoming, on the Union Pacific. Some 6 men will winter at the mine. Manager George A. Lounsbery reports that $40,000 was realized from copper ore shipments in 1899.

Washington County.

(From Our Special Correspondent.)

St. George Copper Mining Company.—The Ibex copper property, which is now operated under lease and bond to the St. George company, has marketed the past year 151,742 lbs. blister copper, 5,853 lbs. matte and 264,828 lbs. ore, which averaged 30% copper.

VERMONT.

Rutland County.

True Blue Marble Company.—This company has bought 108 acres of marble lands southeast of Florence on the Rutland Railroad in the town of Pittsford, and George E. Reyce, treasurer of the company, has bought a 20-acre tract adjoining. This gives the True Blue Company control of what is said to be the largest ledge of white marble in Vermont—about 600 ft. thick. The company now owns 600 acres of marble land and has 80 men working in Whipple Hollow.

Orange County.

Elizabeth Copper Company.—The company's mines are on Copperas Hill near Strafford. A cross-cut tunnel cuts the vein, said to be 30 to 60 ft. wide, at a depth of 400 ft. On this level over 1,100 ft. of drifting has been done. The daily output is 100 tons. The new furnace will have a capacity of 150 tons of roasted ore daily. Compressed air-drills are used in mining.

WASHINGTON.

Kititas County.

Warrior General.—This gold mine at Blewett has started again, after the expenditure of $50,000, it is said, in improvements. Better vanners have been put in the mill, with large canvas surface to save tailings. The present capacity of the mill is 50 tons daily. A new strike of rich sulphide ore is reported at 450 ft. below ground, in No. 9 tunnel, and is to be opened up. A Hallidie tramway connects mine and mill.

The Warrior General Company, organized last spring by Seattle men, now owns the property. It is backed by Ohio and New England capital. The ground was located 20 years ago and has been worked by the Culver Gold Mining Company and the Blewett Company. About 65 men are now busy under Superintendent J. H. Leonard.

Okanogan County.

(From Our Special Correspondent.)

Golden Zone.—The train from mine to mill is completed; machinery at concentrator is about all in place; four tunnels on the vein have been completed, showing ore for 400 ft. in the shaft of from a few inches to full face. Expect to start concentrator by January 15th.

Okanogan Free Gold.—The November run was 240 oz. gold for a 10-stamp mill. Manager Edgecomb states he can mine and mill for $2.50 per ton.

Stevens County.

Lone Star.—This group consists of 2 claims owned by Henry White of Spokane, et al. One tunnel is in 350 ft. and another 120 ft., with 180 ft. of crosscuts. On the dump are 1,000 tons of shipping ore which will average $10 and higher. The proprietors have installed a 7-drill compressor and a 25 H.P. hoist.

Whatcom County.

(From Our Special Correspondent.)

Molybdenum Shipments. — Occasional shipments of molybdenum from the Castleman Mine, Mt. Baker District, are made.

Railroad Extension to Mt. Baker District.—The Bellingham Bay & British Columbia Railroad has let contracts for constructing its first 10 miles of track from Sumas to its new coal fields on Boulder Creek in the foothills of Mt. Baker, 18 miles. The extension must be finished by November 1st, 1900. The line has been surveyed 15 miles further into the heart of the Mt. Baker District.

Ruby Creek Placers.—An extensive hydraulic plant is nearly completed on Ruby Creek, the scene of an historical boom and sudden collapse in 1880. Early in 1898 the Everett Hydraulic Gold Mining Company, composed principally of Minneapolis men, purchased 16 claims covering 320 acres on the lower part of the creek. The company's working force has from 50 to 60 men. Some idea of the magnitude of the work may be obtained from the following facts and figures: The plant consists of a saw mill with a daily capacity of 15,000 ft., with power furnished by two 30 in. Pelton wheels, through 8 in. pipes having a head of 175 ft.; a flume 8,000 ft. long for delivering lumber; over 1,000,000 ft. of a main flume 13,900 ft. long, with a grade of 20 ft. to the mile, the dam 30 ft. high and 80 ft. long. The pressure box will contain 29,000 gal., and the flume leading into it carries 6,000 miners' inches, or about 65,000 gal., per minute. Two pipe lines with 3 monitors will work on the south side of the creek. Each line is graduated from 22 in. in diameter at the pressure box to 20 in. at the bottom of the creek, where it joins 2 distributing lines each 15 in. in diameter, which latter lines have a pressure of 90 lbs. to the sq. in. at the giants. The north sluice is 6 ft. wide, 3 ft. deep and 400 ft. long; the south sluice 4 ft. wide, 3 ft. deep and 600 ft. long. Preliminary work will be carried on during the winter with a reduced force.

WEST VIRGINIA.

Fayette County.

(From Our Special Correspondent.)

Z. T. Henry of Pennsylvania is building 50 beehive coke ovens for the Carbon Coal and Coke Company, and 30 for the Raven Coal and Coke Company, both located on Blake's Branch of Smither's Creek.

Both these companies are making good progress opening their mines. Grading is about finished from the main line of the Kanawha & Michigan Railway. Both the companies are going to put in electric machines for cutting the coal.

W. R. Johnson & Company, of Harewood, W. T. Leavell, manager, are going to put in an electric plant at their mine for cutting coal and will build 50 beehive coke ovens.

Boomer Coal and Coke Company.—This company has a 10-ton electric motor for interior haulage, and expects soon to build from 20 to 50 beehive coke ovens.

WYOMING.

Carbon County.

Ferris Haggerty.—This company at Grand Encampment has 15 4 and 6 horse teams hauling copper ore to the railroad at Saratoga.

Sweetwater County.

Excelsior Rock Springs Coal Company.—This company, in which B. R. Wells of Chicago is interested, has been incorporated to develop coal lands, and, it is stated, manufacture coke by a new process.

FOREIGN MINING NEWS.

ASIA.

India—Mysore.

Coler Gold Field.—The gold output reported for November was 40,442 oz., the largest ever made in one month, and 8,974 oz. more than in November, 1898. The total for the 11 months ending November 30th was 404,834 oz., which compares with 380,041 oz. in 1898, and 354,621 oz. in 1897.

Japan.

According to the London "Standard," the newly discovered goldfields in Hokkaido cover an area of about 650 sq. m. and extend over the whole northwestern corner of the island. They are situated in the Province of Kitami. The center of the goldfields is Mount Horo Noboru, natural boundaries being formed by the rivers Torobetsu and Tombetsu, in the southeast and west. The gold is almost exclusively found in small streams and rivers rising in the Horo Noboru hills. Esashi, until a short time ago a wretched fishing village, with hardly 400 inhabitants, is a rapidly growing town containing already more than 8,000 people.

The reports as to the output of gold are greatly at variance, but it is certain that a company, which is buying up the gold from the diggers on the spot, has exported in the last 9 months pure gold to the value of £1,670. The gold is obtained in the most primitive manner by simply washing out the river sand. Licenses are comparatively inexpensive, and are frequently evaded, as the 10 policemen, who usually maintain order, cannot compel the diggers to comply with the regulations and pay the customary concession tax. The police force, however, is to be increased, in view of the inrush of adventurers expected there from all countries.

Siberia.

The United States chargé d'affaires at St. Petersburg, Mr. Peirce, has sent a copy of a circular issued by the Ministry of Agriculture and Domains, in regard to leasing 6 tracts of land in Siberia, a translation of which reads as below:

The Ministry of Agriculture and Domains (department of mines) informs the public that on February 15th-27th, 1900, at 2 o'clock precisely, there will take place the public auction of the gold bearing lands situated on the northwest coast of the Sea of Okhotsk, under the following conditions:

1. The gold bearing lands of the northwest shore of the Sea of Okhotsk, situated in the basins of the tributary rivers of this sea, which are (1) the Aldama and the Oui, (2) the Lantar, (3) the Mouté, (4) the Némoui, (5) the Kyran, (6) the Yana, are to be leased for the extraction of gold and accompanying metals for a period of 15 years by means of public auction. Each basin forms a separate section, except those of the Aldama and Oui, which will be taken together. The preference will be given to the contracting party who shall offer the highest royalty per pood of gold extracted.

2. Declarations of participation will be received from all persons having, according to the laws in force, the right to engage in gold mining in Siberia, whether Russian subjects or foreign individuals, associations, companies, or joint-stock societies, on condition that they present (1) a guarantee of 100,000 rubles ($51,500) and (2) information regarding the capital to be used for the development of the gold lands in the basin in question. This information must be recognized as correct and the capital as sufficient by the Minister of Finance, in accord with the Minister of Agriculture. Companies and associations are required, besides, to present the statutes by which they are governed; joint-stock societies must be formed in compliance with the statutes governing the same. The requests for approbation of these statutes should be addressed to the Minister of Finance, who, in accord with the Minister of Agriculture, causes them to follow the prescribed course.

Information as to the amount of capital in question, as well as copies of the statutes of associations, companies, or societies, must be presented to the Minister of Agriculture and Domains, at the latest, two months before February 15th-27th, 1900. In the event of the grantee refusing to conclude the contract, the security of 100,000 roubles ($51,500) will be confiscated by the treasury.

3. The auctions will be held at the office of the board of mines (Ministry of Agriculture and of Domains). The bids presented, in writing, folded and sealed, must specify (1) the name of the bidder or of the firm, (2) the residence or office of the firm, (3) the name of the basin of which the bidder desires to obtain the grant, (4 the royalty offered for a pood of gold extracted. The envelope of the sealed paper containing the bid must have (1 the name) of the

person sending, (2) the name of the basin designated in the bid. A bid can refer to only one of the 6 sections designated above.

4. In order to insure the execution of the obligations of the grantee, 30,000 rubles ($15,150) of the guaranty deposited on the day of the auction will be retained and placed in the treasury to the account of the department of mines. Printed copies (in French, German, and English) of the conditions of the contract, as well as of the statutes which must serve as the basis for the constitution of joint-stock companies intended to work the gold mines of Okhotsk, and of the report (in Russian and French) made by the chief of the expedition of Okhotsk, M. Bogdanovitch, mining engineer, are sent from the office by post or delivered on demand, by the gold-mining section of the department of mines (St. Petersburg Ministry of Agriculture and of Domains) every day from 1 to 4 o'clock. For further information, address the same division.

One of the requirements of successful bidders is a deposit of 100,000 rubles ($51,500). The term of lease is 15 years. The inhabitants can roam at will over the leased tract; the preliminary prospecting must be completed within the first 3 years of the term of the lease; the lessee must maintain at the works an assistant surgeon, with all necessary medicines, and pay the Crown annually $515 for the maintenance of a physician; he must maintain a police force in proportion to the number of workmen employed in the ratio of 1 to 30, and furnish the police with food, clothing, lodgings, etc., and pay the Crown, as wages for each policeman, 600 rubles, and $1,030 for an assistant engineer and police inspector. These officers must be provided with homes, transportation, and even luxuries, and a justice of the peace must be maintained and supported. Foreign employes are allowed only by particular sanction of the Governor-General in each case. As security for certain duties and taxation, $15,150 will be retained from the deposit of $51,500 made on the auction day, and in case of non-fulfilment of the terms of the contract the $15,150 will be forfeited. The lessee is subject to all the existing mining laws of the Russian Government, and will also be subject to all laws which may hereafter be enacted.

AUSTRALASIA.

New Zealand.

The Mines Department reports the exports of gold and silver for September and the 9 months ending September 30th as follows, in ounces:

	Gold.		Silver.	
	1898.	1899.	1898.	1899.
September	14,306	29,693	30,711	28,045
Nine months.....	202,745	286,526	218,074	254,254

This shows for the 9 months an increase of 83,781 oz., or 41.3%, in gold; and of 35,180 oz., or 16.1%, in silver.

Western Australia.

The gold exports reported in November were 139,367 oz. This makes a total for the 11 months ending November 30th of 1,505,254 oz. At the values given this was equal to 13,454,435 oz. fine gold, or $27,837,197.

CANADA.

British Columbia—West Kootenay District.

(From Our Special Correspondent.)

Ore Shipments.—The output of Rossland mines for the 11 months and 21 days ending December 21st amounts to 180,000 tons gross, valued at about $3,060,000. The weekly shipments from the same mines average about 5,000 tons.

Abe Lincoln.—The management of this Rossland claim recently purchased a 6-drill compressor in Chicago. The property adjoins Sunset No. 2 and the development work so far consists of 2 shafts 150 and 43 ft. respectively. There are three ledges running through the property. Assay values are in gold and copper.

Black Coek.—Work has started on this Ymir property.

Gertrude.—Drifting continues on the 200-ft. level of this Rossland claim.

I. X. L.—According to Roy H. Clarke, the ledge in tunnel No. 3 has been cut and a considerable body of pay ore has been exposed. The management of this Rossland claim intends making regular shipments in January.

Lerwick.—Negotiations for the purchase of this property by an English syndicate has begun.

Monte Christo.—The management of this Rossland claim has begun making small shipments to the Hall mines smelter, and also to the smelter at Trail.

Nevada.—A small force is at work.

Summit.—A small force is at work.

Tamarac.—This Ymir mine is looking well, and a small force is at work.

White Bear.—The last drift at the 200-ft. level is on pay ore.

Ymir.—The mill of this company is running. The management is putting in another 40-stamp, making 80 stamps in all. From 180 to 200 men are at work. The management pays wages without reference to the union scale.

British Columbia—Yale District.

(From Our Special Correspondent.)

Golden Eagle.—This claim is in Brown's Camp, about 10 miles from Columbia, and adjoins the Volcanic. The claim is 1,000 ft. above the North Fork and 3,000 ft. from it. The vein matter is iron and copper sulphide in calcite and quartz, and is 10 ft. wide. Two hundred feet of work has been done. Assays are reported as high $22 gold, $43 silver, and 18% copper.

Jewel.—This Long Lake proposition has 1,500 tons of $13 ore on the dump. The shaft is down 250 ft. an dwill be sunk another 100 ft. A 5-drill compressor is to be installed.

Josie.—The main shaft is down 112 ft. At the 100 ft. level the ledge is from 2 to 4 ft. wide. Drifting is going on at the 100 ft. level.

Pathfinder.—This claim on the North Fork of Kettle River, is being developed. In No. 3 shaft shipping ore has been cut at 25 ft. The vein is thought to be about 35 ft. wide.

St. Lawrence.—This claim, owned by the Deadwood Gold Copper Company, seems to have a continuation of the Mother Lode lead. Stripping has shown up at least 15 ft. of pay ore.

Summit Gold and Copper Company.—A group of claims owned by this company is being developed at Summit. A double compartment shaft is being sunk on the O. P., and some good ore is being taken out.

Nova Scotia—Guysboro County.

(From Our Special Correspondent.)

Guysboro Gold Mining Company.—This mine at Isaac's Harbor returned 89 oz. from 196 tons for November.

Hurricane Point.—This mine yielded 165 oz. for November.

Mulgrave.—This old mine at Isaac's Harbor has been reopened, and a trial lot of 20 tons of ore taken out gave 15½ oz. gold.

Royal Oak.—This mine at Goldenville has finally, at a depth of 325 ft., reached paying ore.

Nova Scotia—Halifax County.

(From Our Special Correspondent.)

Jubilee.—This mine at Renfrew milled 26 tons of rock which gave them 185 oz. gold.

Nova Scotia—Queens County.

(From Our Special Correspondent.)

Block House.—This mine returned 503 oz. gold from 173 tons quartz for September.

Large numbers of areas have recently been taken up at Mills Village, owing to the discovery of rich drift there.

Ontario—Hastings County.

Gatineau.—These 3 iron mines near Hull are being worked again. About 200 men are employed. The ore is to go to Cleveland, O. The ore is stated to run as high as 68% iron.

Ontario—Rainy Lake District.

(From Our Special Correspondent.)

Minnesota-Ontario Gold Mines Company, Limited.—This company has been organized in Duluth, with Geo. Spencer, president; Franklin Paine, secretary and treasurer. They, with the following, constitute the board of directors: Ward Ames, M. J. Forbes, A. C. Woodruff, A. C. Clauson, St. Paul, and L. R. Brooks, Minneapolis. The company has 2 locations on the shore of Bad Vermilion Lake, on which they have been at work all summer with encouraging results.

Quebec.

It is understood that some very successful experiments have been made in concentrating the chrome ores from the vicinity of Black Lake, and that a company is to be formed to work on a large scale. A small mill at Black Lake has been concentrating chrome ore for some time, but the product has been rather mixed. The experiments referred to above have been on diffrent lines entirly.

MEXICO.

Sonora.

Greene Consolidated Copper Company.—This company is reported to have its mines and smelter at Cananea near Naco running. Scott White of Tuscon, Ariz., is secretary of the company.

SOUTH AMERICA.

Colombia.

South American Land and Exploration Company, Limited.—This New York Company, recently incorporated with $1,000,000 capital stock in $10 shares, has issued a prospectus. The capital can be increased to $5,000,000 to buy new properties. The company owns 100,000 acres of mineral land in the Sierra Nevada de Santa Marta Mountains and property at tidewater near the mouth of the Rio Rancheria. The officers are: President, Henry E. Ayers; vice-president, John Alvin Young; secretary and treasurer, Charles T. Meyer, Sr., all of New York City. Besides the officers, the Board of Directors includes Thomas B. Adams, of the American Smelting & Refining Co.; John H. Wisner, Willard Brown, Francis C. Nichols, William Carpenter and Robert P. Doremus.

French Guiana.

The governor of the colony is now in negotiation with the Home Government in the hope that it will modify the law relating to the importation of coolie labor, and sanction and facilitate the construction of a railway to the gold-fields.

COAL TRADE REVIEW.

New York. Dec. 29.

Anthracite.

The year closes with a cold wave sufficiently severe to stir up retail buyers and remind jobbers that this is really winter time and it will be well for them to have more than a few days' supply of coal on hand. This has, all things considered, been a year of great prosperity for the anthracite trade, with higher prices obtained than in 6 years past. The total shipments from the collieries for the year will exceed 47,000,000 tons, an increase of over 5,000,000 tons over last year's record. This output has been due to the general prosperity of the country and producers have not been obliged to resort to offering special inducements to get buyers.

The year as a whole has been singularly free from labor troubles in the face of a rising market for labor. This simply bears out the statement often made that the wages of the coal miner are good enough—his trouble has been lack of steady employment. The prospects are against any general changes in the mining rate the coming year. There may be local concessions regarding cost of supplies, docking, etc., but the indications are that the miner will be kept pretty busy and his total income will be good.

Bituminous.

The Atlantic seaboard soft coal trade shows little change from its general condition for weeks past. The shoal water ports down East, however, are now probably out of the market for good, and producers can give more attention to the all-rail, the New York Harbor and the Sound trade. Consumers in all these territories seem to want coal nearly as badly as ever.

The holidays have interfered a little with work at the collieries, but the limit in production remains, as for several months, the short supply of cars.

There is a renewed interest in export business—in the press. The producers themselves are so busy tending to orders from their regular customers that possible chances for shipment abroad have received little attention in the past 6 months. The miners and operators in several fields are conferring quietly. If the professional agitators do no mischief by the statements they get into print it will be fortunate. The operators are willing, apparently, to grant substantial advances in wages, but they do not relish the dictatorial attitude assumed by certain labor leaders in press notices.

Transportation from mines to tide shows some improvement. Car supply is perhaps 80% of the demand. Vessel freight rates are firmer.

Prices on soft coal show wide variations. We quote, however, Pocahontas at Norfolk, $2@$2.50; New River at Newport News, $2@$2.50; Georges Creek at Baltimore, $2@$2.50; Clearfield at Philadelphia, best grades, $1.80@$2 for poorer grades and $2.25@$2.50 on better grades; best grades at New York Harbor shipping ports, $2.75; poorer grades, $2.25.

Notes of the Week.

According to a Philadelphia despatch the British steamship "Benedick," Capt. Cox, now en route to Philadelphia from Porman, has been chartered to load coal to Lisbon, Portugal, from Philadelphia. The vessel will carry 3,500 tons of Pennsylvania-mined coal, and it will be the first shipment of the kind ever made to a Portuguese port. Heretofore British-mined coal has had undisputed claim to the trade of Portugal. The Italian steamship "Venus" is loading the first cargo of American coal for Italy, and 50,000 tons more are to follow. During the past year shipments of coal have been made to various ports in South America, South Africa and in the Mediterranean, and the British bark "Cedar Croft" is now loading coal for Port Elizabeth, South Africa.

Pittsburg. Dec. 27.

(From Our Special Correspondent.)

The cold weather and ice in the rivers interfered with navigation and not more than 2,000,000 bu. of coal were shipped during the week. About 8,000,000 bu. are loaded and ready for shipment as soon as the conditions are favorable. Prices remain unchanged. The Pittsburg Coal Company, the combination of railroad coal operators, has just bought 1,300 acres of valuable coal lands from the Mansfield Coal and Coke Company, the only concern that did not enter the combination, and also purchased the

company's charter for a new railroad which will be built to develop the coal territory. This company will continue to operate one mine to fill its present contracts and the Pittsburg Company is now practically in control of all the railroad coal mines in this district.

Connellsville Coke.—The production of coke last week broke all former records, the amount being 200,894 tons, an increase of 4,000 tons over the previous week. The shipments also were greater. The Standard Coke Company began operating 100 new ovens, the Bessemer Coke Company 120, and W. J. Rainey 83. The total shipments aggregated 11,359 cars distributed as follows: To Pittsburg and river tipples, 3,305 cars; to points west of Pittsburgh, 6,138 cars; to points east of Connellsville, 1,916 cars. This is an increase of 85 cars as compared with the shipments of the previous week.

Shanghai, China. Nov. 13.

(Special Report of Wheeler & Co.)

Coal.—Japan coal is very firm, owing to the scarcity of tonnage and enhanced freight rates. Cardiff is quiet, and only a retail business has been done in Sydney Wallongong. Arrivals of all kinds of coal during the fortnight were 11,862 tons. We quote, per ton, as follows: Welsh Cardiff, 21 taels; Australian Wallongong, cargo, ex-godown, 13 taels, and other sorts 6.50@7 taels; Chinese Kaiping, lump, 8 taels; dust, 5 taels, and mixed, 5.50@5.75 taels; Japan, all contracted for.

Kerosene Oil.—Owing to the extreme tightness of the money market business in American oil has been dull. First hands are still asking 2.37 taels per case, less 27%. There have been no recent arrivals, and stocks in godown amount to 606,000 cases. Russian Batum is very dull. Stocks are 233,500 cases. For Anchor and Horse Chop we quote 2.12½ taels per case, and Star and Crescent Chop, 2.11 taels, and loose bulk oil, 1.70 taels. Sumatra Langkat shows no business. An arrival of 75,000 cases makes stocks 126,500 cases. We quote 2.13 taels per two tina.

SLATE TRADE REVIEW.

New York. Dec. 29.

The year closes with promises for an increased consumption in 1900, though export business is expected to be less. Much figuring on a new price-list for roofing slate is going on, but will the quarrymen adhere to this schedule?

In the following table we give the shipments of slate from Slatington and Walnutport, Pa., in 1899, the movement in December being estimated:

	Roofing squares.	School cases.	Black boards crates.
January	13,006	236	1,289
February	7,979	1,046	938
March	10,644	1,527	1,057
April	19,640	1,043	921
May	29,700	885	1,283
June	20,247	2,264	1,323
July	22,235	2 714	3,403
August	15,878	1,573	3,448
September	21,088	2,474	3 959
October	23,036	1,851	3,411
November	14,965	1,424	1,704
December	13,764	294	34,141
Total	212,202	17.331	25,877

As compared with last year, the shipments in 1899 show an increase of 18,639 squares roofing, but a decrease of 2,604 cases school slates and 2,846 crates blackboards.

The list of prices per square for No. 1 slate, standard brand f. o. b. at quarries in carload lots, is given below:

Prices of Roofing Slate.

Size, inches	Monson or Br'ville.	Bangor.	Bangor Ribbon.	Alb'n, or Jackson Bangor.	Lehigh.	Peach Bottom.	Sea Gr'n.	Unfad'g Green.	Red.
	$	$	$	$	$	$	$	$	$
24 x 14	6.10	3.50	3.00	3.35	3.25	5.10	3.00	..	.....
24 x 12	6.60	3.50	3.00	3.35	3.25	5.25	3.00	3.75	.....
22 x 12	6.60	3.50	3.25	3.50	...	5.25	3.00	3.75	.....
22 x 11	6.50	3.75	3.25	3.50	3.35	5.25	3.00	4.00	.....
20 x 12	6 90	3.75	.....	3 50	3.35	5.25	3.00	3.75	.....
20 x 11	6.80	.....	.....	4.00	3.35	5.25	3.00	....	.....
20 x 10	6.80	4.50	3.50	4.00	3.60	5.35	3.25	4.25	9@10
18 x 12	6.80	3 75	.....	3.50	....	5.25	3.00	3.50	.....
18 x 11	7.00	....	.....	.....	...	.....	3.00	3.75	.....
18 x 10	7.20	4.50	3.50	4.00	3.60	5.35	3.25	4.00	9@10
18 x 9	7.10	4.50	3.50	4.00	3.60	5.35	3 00	4 25	9@10
16 x 12	6.80	3.75	.....	3.50	..	.....	2.85	3.50	....
16 x 10	7.10	4.25	3.50	4.00	3.60	5 25	2.85	4.00	9@10
16 x 9	7.00	4.25	....	4.00	3.60	5.35	2.85	4.25	9@10
16 x 8	7.20	4 50	3.50	4.00	3.60	5.35	2.85	4 25	9@10
14 x 10	6 60	3.75	3.25	3.35	....	5 25	2.75	3.75	9@10
14 x 9	6.50	....	.....	.....	.....	.....	2.75	3 75	9@10
14 x 8	6 60	3.75	3 25	3.35	3.25	5.10	2.75	4.25	9@10
14 x 7	6.40	3.75	3 25	3 35	3.25	5.10	2.50	4.25	9@10
12 x 10	5.80	...	.	....	.....	...	2.50	3.25	.....
12 x 9	5.60	....	.....	.....	.....	.....	2.50	3.25	.....
12 x 8	5.50	3.50	.....	3.35	3.25	4 85	2.50	3.50	8¼@8½
12 x 7	5.00	3.25	.....	3.35	3.25	4.85	2.50	3.50	8¼@8½
12 x 6	4.80	3 25	.	3 35	..	4.75	.....	3 50	8¼@8½

A square of slate is 100 sq. ft. as laid on the roof.

In Brownville and Monson delivery quotations can be had somewhat lower than above, which is also true of other brands. No. 1 Bangor are 50c. extra when full 3/16 in. Intermediate sea green, $2.25@$2.45 per square, according to size.

IRON MARKET REVIEW.

NEW YORK, Dec. 29, 1899.

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending Dec. 30, 1898. F'ces.	Tons.	Week ending Dec. 29, 1899. F'ces.	Tons.	From Jan., '98. Tons.	From Jan., '99. Tons.
An' racite	29	22,050	47	42,175	1,139,778	1,759 930
Coke.....	148	208,820	210	249,575	10,229,423	11,543,016
Charcoal.	18	6,350	30	7,650	309,809	305,457
Totals..	195	237,250	287	299,400	11,679,010	13,608,403

Considering that this is usually a very dull week in the iron trade, and that buyers generally wait until well into next month before coming into the market, the number of transactions actually taking place is very satisfactory. The market for finished materials continues to show weakness in spots, the most pronounced being in sheets and sheet-bars. Sheets are quoted as low as $2.90 at Pittsburg for No. 28, and as a result one leading concern has withdrawn quotations and refuses to sell at less than 3.10c., pending a meeting of the sheet manufacturers in January. In the pig iron market, transactions are rather light, particularly in the East, though some small sales of high grade iron are noted. At Pittsburg sales of Bessemer have been made for delivery in the third quarter of 1900 at $25. A considerable movement in steel rails is expected next month, and in the meantime there is little doing.

Buyers and sellers are preparing for next month's struggle in all lines. Indications are general that, while higher prices cannot be expected and lower prices may come, there will be no general softening. In the ore market, transactions have been unusually heavy and concerns are placing orders for future delivery, which ordinarily do not come into the market before spring.

Buffalo. Dec. 27.

(Special Report of Rogers, Brown & Co.)

Holiday week brought its usual quiet and very little business has been transacted. Both buyers and sellers seem glad of an opportunty to rest from the year's tremendous rush, and with common consent put off further trading into the New Year. Here and there a large customer is feeling the market, and there are indications that there will be a stiff buying movement soon after January 1st.

The scarcity of charcoal and coke irons for malleable purposes is becoming more apparent, and consumers are taking everything in sight.

We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, $24@$24.50; No. 2, $23.50@$24; Ohio strong softener No. 1, $24.25@$24.75; No. 2, $23.25 @$23.75; Jackson County silvery No. 1, $31; Southern soft No. 1, $23.50; No. 2, $22.50; Lake Superior charcoal, $26@$27; coke malleable, $24.50 @$25.

Cleveland, O. Dec. 26.

(From Our Special Correspondent.)

Iron Ore.—Ore sales have been few this week. A little quiet season has come after the activities of the two weeks previous. There were more sales, however, than is ordinarily the case at this season, for it is not often that buyers enter the market for ores for a new year before the holidays. Their first purchases are more frequently made in April or just preceding the opening of navigation. A few transactions are reported and the amount altogether sold thus far is quite large in proportion to the whole amount likely to be sold during the coming year. An interesting fact also in connection with these sales is the large proportion of non-Bessemer ore. The low price at which the latter is offered is believed to be among the chief causes for a larger sale of non-Bessemers than usual. Quotations given are for ore for immediate delivery as follows: Specular and magnetic ores, Bessemer quality, $6@$6.25; specular and magnetic ores, non-Bessemer, $5@$5.15; hematite ores, Bessemer quality, $5@$5.25; red hematite ores, non-Bessemer quality, $4@$4.50.

Pig Iron.—In the sales of pig iron also there has been a dropping off from the number of transactions made during the two weeks previous. The sales of the week have been chiefly of foundry metal. The market for all kinds and grades remains very firm at the latest advanced prices. The following are present quotations for iron f. o. b. Cleveland: Lake Superior charcoal, $26; Bessemer, $24.50; No. 1 foundry, $23.50; No. 2, $23; No. 1 Ohio Scotch, $22.50; No. 2, $22; gray forge, $21.

Philadelphia, Dec. 29.

Pig Iron.—This is an off-week in the iron trade. Brokers have very little business to report. A general settling up of books and accounts is in progress. No inquiries are under consideration. Promises were made two or three weeks ago to make definite answers to inquiries, and it is presumed that the promises have been kept. There are quite a number of consumers who are willing to take iron any time it can be had at the prices they have named. The early part of January will develop what there is in this business. Most of the iron called for is of superior grade, very little inferior or common iron being asked for. A good many foundrymen are willing to place orders for large deliveries, believing that the highest range of prices has been reached and knowing that the rush, when it comes, will be for the better grades. In forge iron there is nothing whatever to say beyond the fact that prices are very firm and that mill owners will shortly be in the market for additional supplies, though there is a little disposition in a good many quarters to hold back as long as possible. Makers of iron, on the contrary, say that this signifies nothing, that there will be a rush, and that pig iron is just as strong as ever. Basic iron is quiet; Bessemer very strong, and nothing is being done, so far as known, in low phosphorus.

Muck Bars.—Much business has been done in muck bars within the past few days at prices not known.

Billets.—Nothing definite can be said regarding steel billets, although it is known that considerable correspondence has been going on the past two or three weeks between prospective buyers and makers in Western Pennsylvania and Wheeling. A great deal of billet stock is wanted here.

Merchant Bar.—Merchant bar mills are very busy and could do more business if they were in a position to make deliveries this winter. While some few mills are able to do so, they do not care to accept orders at present. The rumor that quotations have declined is hardly correct.

Nails.—Nails are very quiet, production is large, stocks are increasing and manufacturers say they have nothing to report beyond the maintenance of quotations of two weeks ago.

Skelp Iron.—Nothing new is reported. One or two mills have received inquiries from the West.

Sheet Iron.—The sheet iron manufacturers report a very strong market, but not much business, although they say that it is their fault rather than that of buyers.

Plate Iron.—A good deal of boiler plate is very badly wanted for quick delivery. In fact, there are just now more buyers for small lots at quick delivery than for some weeks, and mill owners must take the fat with the lean. Quotations on such inquiries are very high.

Structural Material.—Several small lots of structural material have been asked for recently for winter delivery. A good deal of work is looming up and the structural iron makers will have a chance to get pretty good quotations if they stand together.

Steel Rails.—Nothing whatever in steel rails, although it is known, or rather believed, that in January quite a business will be done.

Old Rails.—A good many old rails could be sold if holders would get down off their high horse and take decent prices.

Scrap.—The scrap market is as bare as ever. Deliveries are made on old contracts, but very little new business is done.

Pittsburg. Dec. 27.

The iron and steel market continues dull, but prices remain very firm. There will probably not be any change in this condition until about the middle of January, when inquiries and actual business may be expected. Buyers are holding off, evidently anticipating better rates. The output of Bessemer pig iron has been sold into the third quarter of 1900 and it is believed the purchasers intend to use all they contracted for, and that but little will be re-sold. Only those who are compelled to do so are buying iron for the third quarter and a great deal has been sold at $25, Pittsburg. The mills are all active clearing up unfilled orders and will be ready for new business soon after the opening of the year. Sheets continue to be the dullest of all lines, and prices are even lower than last week. One of the leading concerns has withdrawn all quotations on sheets and will stock up the product until the market improves. This concern refuses to sell No. 28 sheets at less than 3.10c., while this gauge is quoted to-day at 2.90@2.95c. A general meeting of sheet manufacturers is to be held early in January, when it is expected something will be done to improve the condi-

tion of affairs. Sheet bars are also on the dull list, but indications point to a stiffening of prices soon. There have been no sales of steel billets, and it is impossible to give a correct quotation. Ferro-manganese is $25 above the price of the past few months for large lots.

Pig Iron.—Prices continue firm, but there is very little buying at present. Several small sales were made during the week, aggregating about 4,000 tons at $25, Pittsburg. Foundry No. 2 is quoted at $23, but it is believed this price would be shaded for a desirable order. Gray forge is quoted this week at $21@$21.25.

Steel.—Very little steel is being sold and there is really no fixed price for billets. Quotations range from $35.50 to $38. The latter figure could be obtained for immediate delivery. Open-hearth steel remains at $42.

Sheets.—Sheets continue dull and prices are a trifle lower than last week. No. 27 is quoted at 2.80@2.85c. and No. 28 at 2.90@2.95c.

Ferro-manganese.—The $100 quotation has been withdrawn for 80% domestic and $125 is now the straight rate. The reason given is that only small lots are being sold.

New York. Dec. 29.

There is little to note in the local iron market. Foreign business would undoubtedly have a more favorable outlook but for the high ocean freights. Recent shipments to Australia include $14,000 worth of mining machinery, $15,000 worth of cement machinery, and $27,000 worth of manufactured iron. A considerable increase is expected in foreign shipments before long.

Pig Iron.—In spite of the generally quiet tone of the market, there has been inquiry from Eastern foundries. Transactions have been light. We quote for delivery to July, 1900; Northern brands, tidewater delivery, No. 1 X foundry, $25.50; No. 2, $24.25; No. 2 plain, $23.25. Southern brands, New York delivery: No. 1 foundry, $23.25@$24.75; No. 2 foundry, $22.25@$22.50; No. 1 soft, $22.25@$22.50; No. 2 soft, $21.25@$21.50; No. 3 foundry, $21.50.

Warrant irons show only minor fluctuations; Alabama No. 2 foundry at $15@$15½; No. 3, $14¾@$14½; No. 4, $14¾@$14½; gray forge, $15.

Bar Iron and Steel.—The demand for bars is pretty easy, but prices stay up. We quote refined iron as high as 2.30c. on dock, and common 2.15c. Soft steel bars, 2.50c.

Plates.—There is but little buying except in small lots. We continue to quote for larger lots at tidewater: Tank, ¼-in. and heavier, 2.70c.; tank, 3/16 in., 2.80c.; shell, 2.90c.; flange, 3c.; marine, 3.10c.; firebox, 3.10c.; universals, 2.70c.

Steel Rails and Rail Fastenings.—There is practically nothing doing. We quote for standard sections $35@$36 f. o. b. Eastern mills. Smaller rails are quoted: 12-lb., $40; 16-lb., $40; 20-lb., $40; 30-lb. to 40-lb., $38; 40-lb. to standard, $37, with the usual advance for small orders. We quote angle bars, 2.45c.; fish plates, 2.40c.; spikes, 2.75c.

Structural Material.—A lot of new buildings are projected, according to the plans rushed in the last few weeks. These plans, however, were filed to take advantage of the city's old building code. The material required may not be called for in months. We quote for large lots of steel at tidewater: Beams, 15-in., 2.45c.; tees, 2.45c.; channels, 2.45c.; angles, 2.45c.; with higher figures for prompt delivery and small lots.

Cartagena, Spain. Dec. 9.

(Special Report of Barrington & Holt.)

Iron and Manganiferous Ores.—In November 17 cargoes of iron ore have been shipped from this port, two of which went to the United States and the rest to the United Kingdom. The iron ore trade continues in the same satisfactory position as reported last month and, we think, is still strengthening. Every mine now capable to produce ore is working with full pressure, and the demand for all classes of ore for delivery over the whole of next year is considerably greater than the producers can entertain, and good orders are now constantly being refused. During the past week production and shipping have been somewhat interfered with owing to heavy rains. Freights to the United Kingdom are from 1s@1s. 6d. per ton easier than they were in the beginning of the month; for the United States, however, they remain about the same.

We quote iron ore per ton as follows: Ordinary 50% Portman 7s.@7s. 6d.; special low phosphorus, 7s. 4d.@7s. 8d.; extra quality, low phosphorus, 8s.; special iron ore, 8s. 6d.; specular iron ore, 10s. 6d. Prices are f. o. b. Portman or Cartagena. For manganiferous iron ore we quote per ton as follows: No. 1, containing 20% iron and 20% manganese, 15s.; No. 1 B, 25% iron and 17% manganese, 12s.; No. 2, 30% iron and 15% manganese, 11s. 6d.; No. 3, 35% iron and 12% manganese, 9s. 6d. All prices are f. o. b. Cartagena. These prices are subject to any new tax that may be levied.

METAL MARKET.

NEW YORK, Dec. 29, 1899.

Gold and Silver.

Gold and Silver Exports and Imports
At all United States ports in November and year.

Metal.	November.		Year.	
	1898.	1899.	1898.	1899.
GOLD.				
Exports	$913.467	$264,310	$14,975,316	$33,521.900
Imports	5,324,601	2,904,043	149,406,770	45,714,718
Excess	I. $4,411,134	I. $2,639,733	I.$134,431,454	I. $12,192,818
SILVER.				
Exports	4,023 079	4.439,166	47,969,406	47,860,823
Imports	2,269,259	2,772,360	25,921,927	27,818,150
Excess	E. $1,753,820	E. $1,666,806	E.$22,047,479	E.$20,042,673

This statement includes the exports and imports at all United States ports, the figures being furnished by the Treasury Department.

Gold and Silver Exports and Imports, New York
For the week ending December 28th, 1899, and for years from January 1st, 1899, 1898, 1897, 1896.

Period.	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	$2,052,900	$36,384	$708,098	$88,518	E. $2,636,096
1899..	14.352,286	13,932,311	29,733,930	3,847,074	E. 26,306,.31
1898..	6,851,230	98,646,019	34,592,009	3,2<0 186	I. 60,482,966
1897..	29,815,546	43,251,753	15,510,553	3,074 474	I. 1,006,128
1896..	40.801,438	76,629,952	36,347,778	3,647,264	I. 3,128,000

The gold and silver exported went chiefly to London, while the imports were largely from Central America and the West Indies.

The United States Assay Office in New York reports the total receipts of silver at 37,000 oz. for the week.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	$ .47½	$ .49
Peruvian soles and Chilean pesos	.43	.45
Victoria sovereigns	4.85	4.88
Twenty francs	3.84	3.88
Twenty marks	4.74	4.79
Spanish 25 pesetas	4.78	4.82

Average Prices of Silver per oz. Troy.

Month.	1899.		1898.		1897.	
	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.
January	27.42	59.36	26.29	56.77	29.74	64.79
February	27.44	59.42	25.89	56.07	29.68	64.67
March	27.48	59.64	25.47	54.90	28.96	63 06
April	27.65	60.10	25.95	56.02	28.36	61.85
May	28.15	61.23	26 31	56.98	27.86	60.42
June	27 77	60.43	27.09	58.61	27.58	60.10
July	27 71	60 26	27.32	59.06	27.36	59.61
August	27.62	60.00	27.48	59.54	24.93	54.19
September	27.15	58.89	28.05	60.68	25.66	55.04
October	26.79	57.98	27.90	60.42	26.77	57.57
November	27 02	58.67	27.93	60.60	26.87	57.93
December	...	...	27.45	59.42	26.83	58.01
Year	...	...	26.76	58.26	27.55	59.79

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

Average Prices of Metals per lb., New York.

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1899.	1898.	1899.	1898.	1899.	1898.	1899.	1898.
Jan	14.75	10.99	22.48	13.87	4.18	3.65	5.34	3.96
Feb	18.00	11.28	24 20	14 08	4.49	3.71	6.28	4.04
March	17.54	11.98	23.82	14 38	4.37	3.72	6.31	4.25
April	18.43	12.14	24.98	14.60	4.31	3.63	6.67	4.26
May	18.25	12 00	25.76	14.52	4.44	3.64	6.88	4.27
June	17.93	11 89	25.85	15.22	4.43	3.82	5 98	4 77
July	18 33	11.63	29.63	15.60	4.52	3.95	5.82	4.66
August	18.50	11 89	31.53	16.23	4.57	4.00	5.65	4.58
Sept	18.46	12.31	32 74	16.03	4.58	3.99	5.50	4.67
October	17.76	12.41	31.99	17.42	4.575	3.78	5.32	4.98
Nov	16.93	12.86	28.51	18.20	4.575	3.70	4.64	5.29
Dec	...	12.93	...	18.30	...	3.76	...	5.10
Year	...	12.03	...	15 70	...	3.78	...	4.57

The price given in the table is for Lake Copper. The average price of electrolytic copper in January was 14.26c.; in February it was 17.02c.; in March, 16.35c.; in April, 17.13c.; in May, 17. 2c.; in June, 16.89c.; in July, 17.099?; in August. 17. 42c; in September, 17.34c.; in October, 16. 94c; in November, 16.49c.

Financial Notes of the Week.

General business is quieter, owing to the holidays and usual stock-taking and settlements at the end of the year. In the speculative markets there has been some recovery from the recent discord in New York and Boston, and rates for money are easier. On call money was obtainable at 2½@4½%, while on time it could be had at 6% for all periods.

Further gold shipments will be made to London. On Thursday $1,250,000 was spoken for Saturday's steamer.

Imports and Exports of Metals.

Port.	Week, Dec. 27.		Year 1899.	
	Expts.	Impts.	Expts.	Impts.
***New York.**				
Aluminum.....long tons	.....	‡11	.....	25
Antimony ore... " "	.....	.....	.....	1,597
" regulus.. " "	.....	.....	.....	1,104
Chrome ore..... " "	.....	125	.....	2,413
Copper, fine..... " "	1,986	579	61,819	26,866
" matte.. " "	256	.....	1,261	1,099
" ore..... " "	.....	.....	.....	49,821
" ash..... " "	.....	18	.....	234
" sulphate " "	606	.....	12,343	.....
" other... " "	.....	.....	.....	135
Cop-nickel matte " "	.....	.....	.....	53
Ferro-mangan'se " "	.....	‡144	.....	422
Iron ore..... " "	.....	.....	.....	50
" pig, bar, rod " "	100	‡51	6.581	4,241
" pipe..... " "	126	.....	27,383	.....
" plates, sheets " "	.....	.....	787	251
" other..... " "	.....	.....	1,209	.....
Lead..... " "	1,576	1,850	55,823	53,415
" ore..... " "	.....	.....	.....	1,191
Manganese, ore. " "	.....	16,672	.....	13,127
Metals, old scrap " "	15	‡76	4,918	6,557
Composition.. " "	6	.....	6.892	255
Nails..... " "	276	.....	19,611	.....
Nickel ..... " "	.....	.....	1,909	120
" Ore ..... " "	.....	.....	.....	4,071
§Railr'd material " "	107	‡120	8,877	4,213
Rails, old..... " "	.....	.....	15,417	468
Spiegeleisen..... " "	.....	.....	.....	1,170
Steel bars, plates " "	.....	‡674	40,913	17,607
" rails..... " "	1,635	.....	53,614	150
" hoops..... " "	.....	.....	831	100
" wire..... " "	750	....	39,083	1,225
" not speci'd. " "	.....	‡83	.....	12,000
Tin " "	.....	102	.....	26,250
" dross or ashes " "	.....	.....	63	.....
" and black plates " "	.....	‡736	.....	36,534
Zinc..... " "	.....	25	282	383
" dross..... " "	.....	.....	437	.....
" ashes, skim " "	14	.....	2,164	299
" ore..... " "	.....	.....	9,919	.....
" oxide..... " "	50	.....	4,374	283
†Baltimore.				
Alumina ..... bags	.....	.....	.....	3,479
Antimony regulus...casks	.....	.....	.....	286
Chrome Ore.....long tons	.....	.....	.....	2,300
Copper, fine..... " "	1,301	.....	37,373	2,783
" matte... " "	.....	.....	.....	.....
" sulphate " "	32	.....	1,621	.....
" pipe..... " "	.....	.....	100	.....
Ferro-manganese " "	.....	.....	.....	2,103
Ferro-silicon..... " "	.....	.....	184	96
Iron pig, bar, etc. " "	.....	1.190	1,233	10.025
" ore..... " "	.....	7,984	.....	275,216
" pyrites..... " "	.....	.....	.....	50,244
Manganese ore.. " "	.....	2,726	.....	80,339
Metals, old & Rails " "	.....	.....	4,604	251
Nails ..... " "	.....	.....	741	.....
Pipe, iron & steel " "	.....	.....	14,558	.....
Spiegeleisen..... " "	.....	.....	.....	1,337
Steel, bars, pl'es.. " "	59	5	36,797	5
" wire ..... " "	230	.....	2.088	66
" rails..... " "	.....	.....	73,473	276
not specified.. " "	.....	.....	2,943	23
Tin..... " "	.....	.....	563	.....
" and blackplates " "	.....	.....	.....	2,992
" other..... " "	.....	.....	43	.....
Zinc..... " "	.....	.....	25	5
" dross, skim. " "	.....	.....	362	.....
" oxide..... " "	.....	.....	19	.....
***Philadelphia.**				
Antimony .....long tons	.....	.....	.....	10
Chrome ore..... " "	.....	.....	.....	3,060
Copper, fine..... " "	201	.....	741	.....
" ore..... " "	.....	‡3,310	.....	41,928
" old..... " "	.....	.....	.....	11
Ferro-manganese " "	.....	.....	.....	1,572
Ferro-silicon..... " "	.....	.....	.....	160
Iron, pig..... " "	.....	‡250	.....	7,440
" ore..... " "	.....	111,794	.....	304,273
" pyrites..... " "	.....	.....	.....	10,153
Manganese ore.. " "	.....	‡600	.....	87,161
Steel sheets..... " "	.....	.....	.....	510
Spiegeleisen..... " "	.....	.....	.....	2,120
Tin..... " "	.....	25	.....	1,095
" and black plates " "	.....	‡149	.....	2,026
Zinc dust ..... " "	.....	.....	.....	10
" ore..... " "	.....	.....	3,093	.....

Total United States.§§

Articles.	October.		Jan.—Oct.	
	Expts.	Impts.	Expts.	Impts.
Antimony.....long tons	.....	117	8	129
" ore.... " "	.....	98	.....	3,778
Copper fine ..... " "	10,293	3,737	84.749	23,903
" sulphate.. " "	165	.....	11,800	.....
" ore & matte " "	342	12,717	4,347	19,916
Iron, pig & bar.. " "	14,182	7,025	218,102	43,534
" ore..... " "	1,193	72,931	22.283	495,390
Iron& steel plates " "	6,124	1,191	54,263	4,319
Iron & steel rails " "	37,273	795	223,270	1,918
" " wire " "	11,369	149	97,826	2,147
Steel, billets, rods, etc..... " "	3 006	3,258	66,726	25,282
Lead, pigs, bars & old ..... " "	3	1	49	208
Lead in ore..... " "	4,598	4,941	56,969	69,209
Nails, cut..... " "	483	.....	8,162	.....
" wire..... " "	2,206	.....	24,265	.....
Tin ..... " "	33	1,777	362	29,294
" &black plates " "	19	5,769	242	48.751
Zinc..... " "	39	174	5,803	1,078
" ore ..... " "	2,972	.....	21,239	.....

*New York Metal Exchange returns. †By our Special Correspondent. §Not specified. ‡Week ending Dec. 22d. §§ Monthly returns of the Treasury Department.

The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, ¾c. a lb. Lead, 1½c. a lb. on lead in ores; 2½c. per lb. on pigs, bars, etc.; 2½c. on sheet, pipe and manufactured forms. Nickel, 6c. per lb. Quicksilver, 7c. per lb. Spelter or zinc, 1½c. per lb. in pigs and bars, 2c. on sheets, etc. Copper, tin and platinum are free of duty.

Cable advices from London state that more gold has been engaged from New York. The amount of gold secured has caused speculation for a fall in discount in London. Three months' bills are widely quoted there at 6¼@6½% for the spot, and at 6% to arrive next week. The principal item of interest in the weekly return of the Bank of England is the increase of £1,000,000 in government securities, showing that the government had to borrow that amount from the Bank in connection with the war disbursements. Details of the gold movement for the week show the purchase of £69,000 in bar gold, of £706,000 in United States coin, of £132,000 in German coin, and of £12,000 in French coin, and the shipment of 150,000 sovereigns to South America.

Owing to the Christmas holidays, London dropped the price of silver ¼d. Business, however, during the interim, was light and not much silver changed hands. There is now a fair inquiry for the metal, and the price to-day closed at 27 3/16d.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding dates last year:

Banks.	1898. Gold.	1898. Silver.	1899. Gold.	1899. Silver.
N.Y. Ass'd..	$168,965,700	.....	$143,963,100	.....
England....	152,952,535	....	146,478,085	.....
France.....	365,285,725	$242,221,360	375,816,685	$232,590,380
Germany...	134,375,000	69,220,000	125,425,000	64,610,000
Spain..	55,310,000	35,710,000	68,000,000	71,475,000
Aus.-Hun..	181 155 000	62,200,000	184 190,000	54,285,000
Neth'l'ds....	21,575,000	33,875,000	18,800 000	24,815,000
Belgium....	15,555 000	7,780,000	14,705,000	7,350,000
Italy	74,506,000	11,685,000	77.435,000	7,500,000
Russia	489,690,000	18,545,000	431,885,000	24,840,000

The returns of the Associated Banks of New York are of date of December 23d and the others are of date of December 21st, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

The statement of the New York Banks—including the 63 banks represented in the Clearing House—for the week ending December 23d, gives the following totals, comparison being made with the corresponding weeks in 1898 and 1897:

	1897.	1898.	1899.
Loans and discounts.	$610,606,300	$712,213,100	$673,315,900
Deposits	669 132,600	814,951,800	740,395,700
Circulation.....	15,728,500	16,236,300	15,996,900
Reserve:			
Specie	104,403,700	168.965,700	143 963.100
Legal tenders.....	74,402,900	54,391,300	51,519,900
Total reserve.....	$178,806,600	$223,357,000	$195,483,000
Legal requirements...	167,283,150	203,737,950	185,098,925
Balance, surplus....	$11,523,450	$19,619,050	$10.384,075

Changes for the week, this year, were increases of $855,400 in deposits, $2,732,500 in specie, $839,600 in legal tenders, and $3,358,250 in surplus reserve; decreases of $68,400 in circulation, and $3,094,000 in loans and deposits.

The statement of the United States Treasury on Wednesday, December 27th, shows balances in excess of outstanding certificates as below, comparison being made with the statement of the corresponding day last week.

	Dec. 20.	Dec. 27.	Changes.
Gold.....	$241,448,286	$239,995,638	D. $1,452,648
Silver	9,742,214	9,974,064	I 231,850
Legal tenders.....	15,840,194	16,851,645	I. 1,011,451
Treas notes, etc...	1,002,869	1,055,010	I. 52,141
Totals.....	$268,033,563	$267,876,357	I. $157,206

Treasury deposits with national banks amounted to $84,295,546, an increase of $1,701,207 during the week.

Shipments of silver from London to the East for the year up to December 7th, 1899, are reported by Messrs. Pixley & Abell's circular as follows:

	1898.	1899.	Changes.
India.....	£3,968 365	£4,939,725	I. £951 360
China.....	635.391	1,318,478	I. 683,087
The Straits.....	395,405	274,785	D. 120,620
Totals.....	£5,019,161	£6,532,988	I.£1,513,827

Arrivals for the week, this year, were £147,000 in bar silver from New York, £41,000 from Australia, and £36,000 from the West Indies; total, £224,000. Shipments were £130,000 in bar silver to Bombay, £52,500 to Shanghai, and £5,279 to Singapore; total, £187,779.

Dearer money in London caused a further decline in Indian exchange. All the Council bills offered there were taken at 16.01d. per rupee.

Other Metals.

Daily Prices of Metals in New York.

December	Sterling Exchange.	Silver. Fine oz. Cts.	Silver. London, P'nce	Copper. Lake, cts. ₩ lb.	Copper. Electrolytic, ₩ lb.	Copper. Lond'n standard £ ₩ ton.	Tin, cts. ₩ lb.	Lead, cts. ₩ lb.	Spelter, cts. ₩ lb.
23	4.87¼	58½	26 1/16	16½	15½	.....	24¾	4.65	4.65
25	...	....	....	...	...	.....	....	....	.....
26	4.87¼	58½	....	16½	15½	.....	24½	4.65	4.60
27	4 87¼	58⅝	26 1/16	16½	15½	69 0 0	24¾	4.65	4.55
28	4 87¼	58¾	27	16½	15½	69 7 6	25½	4.65	4.55
29	4.87¼	59¼	27⅛	16½	15½	69 15 0	25½	4.65	4.55

The quotations given for electrolytic copper are for cakes, ingots and wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—The holidays which have intervened since we last went to press have served to relax the strained conditions which have been characteristic of this, as also almost all the other markets. Business here as well as abroad was suspended until Wednesday, when a better feeling became manifest, which has not demonstrated itself in the size of the business done since, but in the change of sentiment. There is not so much evidence now on the part of producers of a desire to market their products, they being disposed to wait until manufacturers show more of a disposition to enter the market and cover their requirements, as they no doubt will before very long. Prices have, under the circumstances, been rather nominal, and the quotations are 16@16¼c. for Lake; 15⅝@15⅝c. for electrolytic in cakes, wirebars, and ingots, and 15¼c. in cathodes.

The better tone which became apparent in the London market the end of last week has made further strides, the opening price of Standard copper on Wednesday being £69, from which there was a reaction that same day to £68 10s., but the loss was fully made up on the 28th, when the price advanced to £69 7s. 6d., closing to-day at £69 15s.@£69 17s. 6d. for spot ,and 5s. higher for 3 months.

For the first time in several months the 3 months' price is again at a premium, which seems to be an indication of more confidence that the prices which have now been established will be maintained. Refined and manufactured sorts we quote: English tough, £74; best selected, £75; strong sheets, £78 10s.; India sheets, £77 10s.; yellow metal, 6½d.

Tin.—There has been little change in the price for spot, which remained steady at about 24¾c., except during the last few days, when, as a result of a very pronounced advance in London, prices here were raised to 25½c. for spot and 25c. for January.

In London the market opened on Wednesday at £105 10s., advanced on Thursday to £109 10s., and closed at £111 15s.@£112 for spot, and £1 higher for 3 months.

Lead continues very firm, with prices unchanged at 4.65c. New York; 4.60c. St. Louis.

In Europe the conditions are also unchanged, and the quotations are £16 7s. 6d. for Spanish lead, and £16 10s. for English lead. We have to correct an error made in last week's issue, as, instead of quoting the above prices, the quotations were given as £17 7s. 6d. and £17 10s. respectively.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is quiet at 4.60c. for common and 4.65c. for refined. Trading is very light.

Spanish Lead Market.—Messrs. Barrington & Holt, of Cartagena, Spain, write us as follows: In November the average price of lead was 87.20 reales per qtl., equivalent to £15 7s. 8d. per long ton, f. o. b. Cartagena; the average exchange being 31.71 pesetas to £1, and silver 13.50 reales per oz. Exports in November were: Pig lead, 2,107,490 kgs. to France, and 907,449 kgs. to Great Britain; total, 3,014,839 kgs.

Spelter.—Prices have suffered a little more and the closing quotations are 4.55@4.60c. New York and 4.30@4.35c. St. Louis.

In Europe, too, prices are somewhat easier, good ordinaries being quoted £20@£20 2s. 6d. and specials £20 5s.@£20 7s. 6d.

Spanish Zinc Market.—We are advised by Messrs. Barrington & Holt of Cartagena that the production and prices of zinc ore are weak, owing to the fall of London prices of spelter. In November exports were 5,350,000 kgs. zinc blende, and 1,650,000 kgs. calamine to Antwerp; total, 7,000,000 kgs.

Antimony.—Prices remain unchanged at 10½@11c. for Cookson's, 9¾@9⅞c. for Hallett's, and 9½@9⅝c. for U. S. Star.

Platinum.—Demand is good, and prices are firmer. In large lots we quote $17.75, and for smaller quantities, $18 per oz., in New York.

For chemical ware (crucibles and dishes), best hammered metal, we quote as follows: In lots of 250 grams or more, 67½c. per gram, and for smaller quantities, 70c. per gram; unmanufactured platinum will be supplied in same quantities at 2c. less per gram.

Nickel is firm and demand very brisk. Quotations are firm at 40 and 45c., according to size of order.

Quicksilver.—The New York price is unchanged at $51 per flask for large lots. Smaller quantities sell at $52.50@$54. The London quotation is £9 12s. 6d., with the same price named from second hands.

The Minor Metals.—Quotations are given below for New York delivery:

Aluminum.	Per lb.		Per lb.
No. 1, 99% ingots.....	33@37c.	Bismuth.....	..$1.60
No. 2, 90% ingots... .	31@34c.	Magnesium.....	$2.75@$3
Rolled sheets. .. ....42c. up		Phosphorus...	....40@50c.
Alum.-bronze.....	20@23c.	Tungsten	70c.
Nickel-alum.....	33@39c.	Ferro-tungsten, 60%.....	60c.

Variations in price depend chiefly on the size of the order.

LATE NEWS.

A dispatch from Butte, Mont., December 28th, says: "The first of the big cases between F. A. Heinze and the Montana Ore Purchasing Company on one side, and the Boston & Montana and other companies of the Amalgamated Copper Company on the other, was to-day decided in favor of Heinze and the Montana Company by Judge Clancy of the District Court. The ground and ore bodies involved are valued at $1,000,000, and the ore already taken by Heinze is valued at as much more. The decision gives him the right to follow the ore bodies through the entire northern half of the Pennsylvania claim, which adjoins the Johnstown, owned by him. Several other suits are pending in the court, in which the Boston & Montana Company is plaintiff, and sues for about $600,000 as damages for ore taken out of the ground by Heinze."

(From Our Special Correspondent.)

Joplin, Mo., December 27th.—The week ending December 24th, 1899, showed a marked improvement in market conditions, and zinc ore was in good demand at greatly improved prices. Top grade zinc ore sold for $37 per ton and all grades advanced from $1.50 to $2 per ton. Over 10 cars of Joplin ore sold for $36 per ton, and there were a number of sales at $36.50. Lead sold all the week at $27.50 per 1,000 lbs. delivered. The sales for the last week of the year will undoubtedly bring the total for the year up to $11,000,000, and if the output and values had been maintained, as seemed probable earlier in the year, the total would have exceeded $12,000,000. During the corresponding week last year top grade zinc ore sold at $31.50 per ton, and lead sold at $21 per 1,000, and the turn-in was less than this year by 1,766,790 lbs. of zinc and 280,050 lbs. of lead and the value was less by $58,955. For the corresponding 51 weeks of last year the lead sales were greater by 3,267,510 lbs., but the zinc sales were less by 61,282,170 lbs. and the value was less by $3,267,510. As compared with the preceding week, the sales were greater by 3,127,930 lbs. of zinc and 385,590 lbs. of lead and the value was greater by $38,789. Following is the turn-in by camps:

	Zinc. lbs.	Lead. lbs,	Values
Joplin.....	1.762,500	421,020	42.371
Carterville.....	1,325,160	285,810	29,063
Webb City.....	812,960	56,110	14.550
Oronogo.....	1,041,670	.....	18,085
Belleville	437,290	7,910	7,891
Duenweg...	83,850	106,340	3,757
Stotts City	345,580	.....	5 875
Central City.....	213.080	16,180	4,174
Carthage.....	254,220	.....	4,393
Neck City	151,800	.....	2,749
South Jackson	9,730	24,630	947
Cave Springs.....	81,160	.....	1,420
Galena—Empire	2,712,540	265,670	53,419
Aurora.....	924,290	27,530	12.530
Granby—Newton Co...	490,000	20,000	7,600
Alba	51,890	.....	830
Morgan County.....	...	32,380	809
Springfield	88,100	.....	1,410
Wentworth....	176,500		3,000
Lehigh	55,370	.....	953
District total.....	11,147,670	1,263,580	213,688
Total 51 weeks....	503,702,390	47,756,420	10,711,908

There has been the usual lull in trading in mines and mineral lands preceding the holidays, but negotiations are pending for some large and valuable tracts that will probably be closed shortly after the holidays, and the indications are that the year 1900 will be the greatest in the history of the mining district. Among the sales reported this week is that of a 20-acre fee at Aurora, which was purchased for Colley & Co., of Boston, by J. W. Baker & Co., their Joplin and district agents. The Jack Rabbit and the Madison, two of the best producing mills in the district, are located on the tract, which cost the Colleys $55,000. Chicago parties have purchased the Layne 40 acres lying just inside the city limits on East Fourth St., for $37,500. There were a number of minor transactions, but no deals of any magnitude.

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 780.)

New York. Dec. 29.

Heavy Chemicals.—The year closes with limited stocks, and higher prices. The recent stoppage of the Barberton (O.) alkali plant causes comment. Pittsburg glass people are interested. Imported goods are affected by the scarcity of freight room from the other side.

Articles.	Domestic.		Foreign.
	F.o.b. Works.	In New York.	In New York.
Alkali, in bags.	85@90c.	95@1.00	95@1.00
Caustic Soda, high test....	$1.85@2.00	$2.10@2.15	$2.35@2.40
98% powd....	.....	3 12½@ 3.50	.....
60@74 % pwd	....	2.50@ 2.62½	....
Sal Soda	60@70c.	....	67½
" conc.	1.45@1.75	....	1.60@1.65
Bicarb. Soda..	1.25@1.37½	.....	2.25@2.37½
" " extra	3.25@3.50	.....	
Bleach. Pdr., Eng. prime..	.....	....	2 37½@2.50
other br'nds.	....	....	2 15@2.25
Chl. Pot cryst	....	8 75@9.00	9.12½@9.25
" powd.	....	9,00@9.12½	9.25@9.37½

Prices are generally for large quantities, and in many cases depend upon make, test and package.

Acids.—Contract deliveries predominate. Better export demand for blue vitriol, especially from France.

Quotations are in large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified.

Acetic, No.8....	$1.60@1.75	Nitric, 42°.....	4.75@ 5.00
Blue Vitriol, best	5.00@5 25	Oxalic	5.75@ 6.00
Muriatic, 18°.	1.20@ 1.25	Sulphuric, 66° ...	1.20@ 1.25
Muriatic, 20°.	1.35@ 1.40	Sulphuric, 60°	1.05@ 1.10
Muriatic, 22°.....	1.50@ 1.55	Bulk 50° ton....	16@17.00
Nitric, 36°	3.87½@4.12½	Sulphurous, 100% SO_2 anhydrous.	8.00@10.00
Nitric, 38°.....	4.12½@4.37½		
Nitric, 40°	4.37½@ 4.75		

Brimstone.—Market quiet. Spot best unmixed seconds are quoted $21.50@$22 per ton; shipments, $21@$21.25, and thirds $2 less per ton. Sulphur mines in Japan, according to report, will be worked by an American syndicate.

Pyrites.—More contracts are being booked. Imports at this port this week were 607 tons from Liverpool.,

We quote American pyrites as follows: Mineral City, Va., lump ores, $4.50 per long ton (basis 42%), and fines $4.20; Charlemont, Mass., lump, $5.50, and fines, $4.75; Pilley's Island, lump, $6.50, and fines $4.50 per long ton, delivered in New York. Spanish pyrites, 13@15c. per unit, according to percentage of sulphur contents, delivered ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46% to 51% of sulphur; American, 42% to 44%, and Pilley's Island, N. F., 50%.

Fertilizing Chemicals.—The American Agricultural Chemical Company, with the acquisition of the Nickerson plant at Easton, Pa., controls about 28 of the largest fertilizer concerns in the East. The South is buying fair quantities of the leading ammoniates. Sulphate of ammonia, gas liquor, sold for shipment at $2.90 per 100 lbs.

Articles.	F. o. b. Wks.	In N. Y.
Potash, muriate, 80@85%. 100 lbs.	....	$1.78
" " 95% "	....	1.81
" sulphate. 90% "	.....	1 98½
" " 96% "	.....	2.10½
" d'ble m're salt, 48@53% 100 lbs.	....	66c.
" " " 30% "	.....	89c.
" kainit, 12.4%. long ton.	.....	8.70@8.95
" sylvanit.. per unit.	.....	37@38c.
Sulph. Am., gas (25%)....100 lbs.	.....	2.90@2.92½
" " bone ..... "	....	2.80
Blood, dried, h-gr, Chi. per unit	1.72½@1.75	.....
" " " N.Y., "	.....	1.90
Azotine..... "	1.75@1.80	1.80@ 1.85
Bone black, diss., 17@18%...ton	....	16.00@16.50
Fish scrap, acid ..... "	10.50@11.00	12 50
" " dried .... "	19.50@20	21.50
Tankage h. gr., Chicago.... "	15@15.50	21.00
" concentrated.. unit.	1.60	1.95
" bone.. ... ton.	.....	20.00@21.00
Bone, steam gd, domestic.. "	....	21.00@23.00

The quotations on potash are on the basis of foreign invoice weights, tares and analysis, in quantities of not less than 500 tons bulk salts or 50 tons concentrated salts.

Nitrate of Soda.—Sales on spot were made at $1.80 per 100 lbs., while shipments are held at $1.62½@$1.70, according to position.

Phosphates.—Exports are hindered by limited freight room, while home consumption is interfered with by the small car supply; hence stocks at mines are increasing. In Tennessee at least 95,000 tons of rock in the Mt. Pleasant district are awaiting shipment. In Florida 78 high grade hard rock mines are operating in anticipation of increased foreign shipments. South Carolina has shipped largely to the Atlantic coast this year.

The foreign market for American phosphates is firmer. A charter is spoken of 1,218 tons from Port Royal to Tyne at 14s. 6d. Deposits of phosphates in Japan are reported, but samples showed only 4@8% phosphoric acid.

Latest quotations for the European market, c. i. f. United Kingdom or North Sea ports, are as follows: Florida high grade rock (77@80%), 8¾@8⅞d. ($13.65@$13.85 per long); Florida pebble (68@73%), 7¼d. ($9.80 per ton); Florida Peace River (58@63%), 7½d. ($9.80 per ton); Tennessee high grade rock (78@80%), 7½d. ($11.95 per ton); South Carolina rock, 6½d. ($8.19 per ton); Algerian (63@70%) rock, 7½d. ($10.05 per ton), and (58@62%) rock, 7d. ($8.40 per ton).

We quote: Florida high grade, 78@80% rock, $9.50@$10 per long ton f. o. b. Fernandina. The freight rate to New York is about $2 per ton. Florida land pebble, 68@73%, $7@$7.50 per ton, delivered in New York. Florida Peace River, rock, 58@63%, $4.50 per ton f. o. b. Punta Gorda. South Carolina crude rock, $4.25@$4.50; hot-air dried, $4.50@$5 per long ton f. o. b. Fetterressa, S. C. Tennessee, 78@80% rock, $4@$4.50 f. o. b. Mt. Pleasant, and 75% rock, $2.75@$3 f. o. b. High grade Tennessee rock, ex-vessel New York, $9 @$10 per ton. Hickman County blue-gray rock, 65%, and not over 3% iron and alumina, $2.50@ $2.75 per ton f. o. b. mines. Concentrated phosphates, 13@15% av. P_2O_5 60c. per unit at sellers' works. Acid phosphates, $6.25 per ton for 14% in bulk, f. o. b. Charleston, S. C.

Valparaiso, Chile. Nov. 18.

(Special Report of Jackson Bros.)

Nitrate of Soda.—The market has been very quiet and prices have weakened, due, to a great extent, to the firmness of freights. The syndicate formed in Iquique to sustain prices has been obliged to lower its limits for this year's delivery of 95% to 5s. 3d., steamer terms, without even effecting sales, as a few outside producers have undersold them. Little disposition is shown to operate either for this or next year's delivery, and only a few transactions have taken place for November-December 95% at 5s. 3½d.@5s. 1¾d. alongside. The production in October was 2,833,000 qtls., making a total of 25,050,000 qtls. for the 10 months, against 23,864,000 qtls. in 1898. The consumption for the 10 months, this year, was 27,533,000 qtls., against 24,763,000 qtls. in 1898. The exports for October were 3,918,000 qtls., making a total of 23,457,000 qtls. for the first 10 months of this year. We quote 95% November-December, 5s. 1½d., and 96%, 5s. 2d. ordinary terms and 95% for January-Mar., 1900, 5s., and 96%, 5s. 1½d. alongside, all sellers. The price of 5s. 1½d. with all round freight of 30s. stands in 7s. 2½d. per cwt. net cost and freight, without purchasing commission. Reported sales are 379,000 qtls.

MINING STOCKS.

Complete quotations will be found on pages 807 and 80 of mining stocks listed and dealt in at:

Boston.	Philadelphia.	London.
Colo. Springs.	Spokane.	Mexico.
Denver.	Salt Lake.	Paris.
New York.	San Francisco.	Toronto.

New York. Dec. 29.

The market is again settled, and prices have improved. In the copper section Amalgamated, after selling off sharply from $81½ to $79¼, on announcement of the regular quarterly dividend of 1½% and an extra of ½% ($1,500,000 in all) dropped to $78 on Friday last, but recovered to $80⅞ this week. Anaconda rose from $31½ to $38¼ on fair dealings. British Columbia was weak at $8@$9, and Tennessee at $10@$12. Markeen, Whipsaw and Arizona Lead of Arizona were dormant.

American Smelting and Refining strengthened; the common shares rising from $30 to $35⅞, and the preferred from $81 to $85, ex-dividend. Standard Oil sold at $451½@$450½. Sloss-Sheffield common at $26, and Flemington Coal and Coke at $22@$21⅝.

Ontario of Utah brought $7.75@$8, while Ophir of Nevada sold at 75c., Mexican at 33c., and Con. California & Virginia, $1.45.

The Colorado stocks, especially those of Cripple Creek, are in favor from the good dividend showing this month. Isabella sold up to $1.40; Golden Fleece, 28c.; Work at 28@30c.; Mollie Gibson at 20@21c.; Alamo at 12½@16c.; Findley at 12½c.; Argentum Juniata at 21c., Specimen at 9c., and Cripple Creek Consolidated at 15c.

Kingston & Pembroke of Ontario sold down to 35c.

There has recently been some good buying of Colorado Fuel and Iron at $39¾@$43½. The net earnings of the company in November were $229,200, an increase of $114,169 as compared with last year. For the five months ended November 30th the net earnings were $803,383, against $356,025 during a like period in 1898, an increase of 126%. Fixed charges for the twelve months ended June 30th, including bond interest, taxes, and preferred stock dividend, require $600,000; leaving a surplus for the five months of $203,382.

In anticipation of a dividend on the common stock of the American Steel and Wire Company in January, speculation has strengthened, the shares selling up to $47⅛, while the preferred brought $90½. Tennessee Coal and Iron has also been stronger, and on Thursday sales were made at $84¼, an advance of 20 points since the recent liquidation. Federal Steel also shows enthusiasm, selling up to $51¾ for the common and $73¼ for the preferred. American Steel Hoop common was purchased at $41½, and the preferred at $80. American Tin Plate common is better at $26⅞@$27½, and the preferred at $79@ $80. Republic Iron and Steel was lower on Thursday, the common shares selling down to $19½, and the preferred to $64⅛.

Boston. Dec. 28.

(From Our Special Correspondent.)

Further liquidation squeezed copper share values on Friday last, and a bad shaking up was only averted by considerable cash investment orders. A comparison between the selling prices on Friday and the previous Monday show a drop of 18 points in Boston & Montana at $255; of 4½ points in Butte & Boston at $40; of 7 points in Tamarack at $173; of 5 points in Calumet & Hecla at $715, and of 4 points in Osceola at $65, while Amalgamated was quoted at $79.

The failure of the Globe National Bank has been followed by a warrant of arrest issued for the former president, Charles H. Cole, for "wilfully misappropriating the funds of the bank." Meantime Mr. Thomas W. Lawson comes forward with the statement that "What has happened would have happened had there never been a copper boom," and expresses confidence of higher prices for copper shares. As yet the market does not reflect his optimism; in fact, further liquidation is looked for on State Street.

Of the companies registering with the Globe National Bank, the Tamarack, Isle Royale, Boston & Montana, and Osceola have opened books with the State Street Trust Company.

An auction sale of 5 shares of the Boston & Colorado Smelting Company was made at $50, ex-dividend.

Quotations to-day are as follows: Calumet, $715; Tamarack, $170; Boston & Montana, $260½; Osceola, $69; Arcadian, $23; Amalgamated, $79, ex-dividend; Quincy, $140; Franklin, $13; Isle Royale, $23; Utah, $24.25; Parrot, $38; Copper Range, $28; Centennial, $16; Wolvertine, $38; Arnold, $5; American Zinc, $15¼; Atlantic, $23; Cochiti, $12½.

Colorado Springs. Dec. 23.

(From Our Special Correspondent.)

Business in stocks is good, and in November sales on the Exchange aggregated 29,549,56[illegible] shares, of a cash value of $4,141,864. Reports submitted at the annual meetings of various companies recently indicate that the earnings of Cripple Creek are growing. Besides the new Gold Coin mill, with an initial capacity of 350 tons per day, will materially help the development of the district.

Salt Lake City. Dec. 23.

(From Our Special Correspondent.)

Midwinter holiday periods rarely favor speculation, and for 10 days the situation in Boston has occupied the attention of our large operators. Trading is stagnant. On the other hand, I am told that within the past 2 weeks $300,000 has been sent to Boston for shares in Utah mines, Centennial-Eureka, a strong leader with Utah Consolidated, Bingham Copper and Gold receiving good support, while some orders were sent for United States. In truth, Salt Lake has made hay during the December panic in Boston. Some alert operators took double profits, first by shorting and then buying. It is anticipated that our home market will gradually improve as conditions right themselves. There was no call to-day, and some brokers favored a vacation till after New Year's, but the exchange decided to resume business December 26th.

Apex is soft, though good reports come from the mine. Alice has practically dropped out of sight. Anchor is listless. Bulling Beck slowly finds a lower level. Chloride Point is very weak. I learn that the cyaniding products marketed in 1899 contained about 140 oz. gold and 80,000 oz. silver, which, of course, could not have met current expenses. Daisy does not strengthen with good reports from the property. Daly-West is again higher and stronger. Dexter's improvement may be said to be due to change of management. Eagle-Blue Bell rules slightly lower. Grand Central hung around $6 all the week, but to-day there is a sudden demand at $6.05 openly bid. Horn Silver is off. Joe Bowers probably will rule low till the reorganization is finally settled. Lower Mammoth keeps the talent guessing; it swung over 20 points during the week, closing strong at the highest. Mammoth dividend prospects are uncertain; some brokers are offering 7c. a share for the anticipated New Year's premium, but the shares indicate there will be none. Mercur is soft. Northern Light was firmer and did some little business. Ontario shares are strong. Sacramento is dumpish and it would seem insiders are un-

loading. South Swansea continues to gain. Star Consolidated is firmer, with fewer offerings. Swansea continues very strong. Sunshine is about at low water mark.

Local papers comment on the friction between the Mackintosh sampler and the American Smelting and Refining Company, and some accounts intimate faulty work by the Park City plant, which facts do not substantiate. Briefly, there is no competitive market for smelter products and mines must comply with conditions imposed by the smelters or go out of business. The fiat has gone forth that Daly West and Ontario crude ores must be sampled by the valley plants, or in a method similar, and to conform to this decision a Vezin sampler, which the American Smelting and Refining Company approves, is being put in at the Mackintosh plant for these products. The Guggenheims make no complaint, and Silver King, Anchor and other products are sampled as heretofore. Park City mines do not like to break away from the time-honored custom of home sampling and resent the implication that the home sampler puts higher values in the samples than the products contain.

The failure of the Globe National Bank of Boston and the wrecking of the United States Oil Company is largely due to Utah mining investments, in which some $4,250,000 was paid, very nearly evenly divided between the United States at Bingham and Centennial-Eureka at Tintic. The boosting of these and other shares by the United States Oil people and the pounding them down by Standard Oil influences, with the resultant crash, is recent history. From this view point it seems assured that Standard Oil will get United States Bingham properties at about its own terms. Certain straws indicate that Standard Oil also intended to take in Centennial-Eureka and would have succeeded had it not been for Mr. A. F. Holden and his backers in Salt Lake, who were large buyers when these shares were thrown overboard. Hence, at present, Standard Oil in Utah is confined to Bingham, where it controls the Highland Boy, or Utah Consolidated, which has a copper smeltery 9 miles south of Salt Lake City. With the addition to its holdings of the half dozen mines of the United States, producing lead, pyritic iron and silver, copper and gold ores, there is a likelihood, in fact almost a certainty, of the Utah Consolidated smelter being greatly enlarged and made a general smelter, which would be liable to enter the field of the trust and treat custom ores This is the hope entertained by several large mine owners and in part offsets the chagrin over Standard Oil becoming all powerful at Bingham.

San Francisco. Dec. 23.

(From Our Special Correspondent.)

This was holiday week, and speculation was exceptionally dull. Reports from the Comstock do not disclose anything new; hence share-values ruled lower.

Some quotations noted are: Consolidated California & Virginia, $1.50; Ophir, 75c.; Sierra Nevada, 42c.; Mexican, 30c.; Confidence, 65c.; and Hale & Norcross, 32c.; while Standard Consolidated of California sold at $2.45.

On the Oil Exchange some business has been done, but at lower prices. Tidal Wave sold at $2@$2.05; Anaconda, $1.20@$1.30; Barker Ranch, $1.15; Century, $1.10; Caribou, 90c.@$1.; and Yukon, $1.65. On the Producers' Oil Exchange, Parkfield sold at $14; San Luis, $5.37½; and Dominion at 40@45c.

London. Dec. 13.

(From Our Special Correspondent.)

The London mining market has been flatter this week than ever, and members of the Stock Exchange have had to resort to horse-play in order to make the time pass. Nothing at all has been done in South Africans, either in land or gold shares, and prices have drooped generally. The prospect of a long campaign, the revolt of the Cape Dutch, and the disaster which attended Gatacre's first attempt to drive the enemy out of Cape Colony, have all had their effect in depressing the mining market all round.

The West Australian market has again been much disturbed by the discussion of the sulphide problem. As I mentioned last week, the distance from smelters makes it necessary to evolve some other process for the treatment of the refractory sulphides at Kalgoorlie. For some months now we have heard rumors of technical difficulties at the largest of the mines, Lake View Consols, and though the directors have always denied the truth of such rumors, they have at last been obliged to confess that the sulphide problem has staggered them, at least temporarily. During the last few months the output of gold has been about 30,000 oz. per month, but the output for November is less than 12,000 oz., valued at £47,000. The directors state that this low result is due to the fact that the interim manager appointed during Mr. Callahan's leave of absence was not so able a man as they thought, and they have therefore removed him and hurried Mr. Callahan back as soon as possible. This explanation may be true as far as it goes, but I doubt its being the complete one. The probability is that the last few months' returns have been swelled by the treatment of reserves of oxidized ore, and now that this ore is exhausted the output from the sulphide ore is as great as could be managed with the present plant and the present metallurgical knowledge of the managers. My information goes that the veins are not exhausting, but that they are all now sulphides and the oxidized ores are worked out. In this connection it is interesting to note that the managers of another of the Kalgoorlie mines, Hannan's Brownhill, consider that their new plant for treating the sulphides is satisfactory. At this mine they have tried quite a number of processes at the recommendation of various experts, but now that they have adopted a dry crushing, roasting and cyaniding system they seem to have hit on a process which will give satisfactory results.

It was hoped by promoters that the tide of the African war would have turned sufficiently in favor of England by December 1st to cause a buoyancy in City circles, and that consequently the present month would be an excellent one for bringing out new propositions. Their sanguine hopes have not been fulfilled, and consequently no new propositions are placed on the market. The city is suffering from dearness of money; the Bank rate is 6%, and financial houses will not commit themselves to helping new issues. The chief occupation of the month has therefore been the usual preparation of yearly reports of companies and their general meetings, which come in floods at this time of year. The South African reports are of course dismal reading. The report of the British South Africa Company, which is out this week, only brings affairs up to March, 1898, so the interest in it is not very great. The copper companies naturally have good reports to make, while among gold companies the Champion Reef of India is perhaps the most interesting. The profits of this company for the year ended September 30th was £335,000, out of which a dividend of 125% on the share capital of £220,000 has been paid. The advance in prosperity of this company has been uniform, the distribution having grown from 35% in 1894 to 65% in 1895, 67½% in 1896, 100% in 1897, 110% in 1898, and 125% in 1899. Every year large sums have been written off for depreciation and put aside for increase and renewal of plant.

Some months ago I sent you an account of the Hargreaves-Bird electrolytic alkali process, which has been worked experimentally on a commercial scale for some time now. The owners of this process have so satisfied themselves as to all details of its working that they have decided to establish a large plant. For this purpose they have formed the Electrolytic Alkali Company, Limited, with a capital of £500,000, to purchase the patents, to buy salt lands in Cheshire and to erect works and plant. The patents are to be acquired for £100,000, partly in cash and partly in shares, while £200,000 in cash will be available for the purchase of land, erection of works and working capital. The remaining £200,000 will not be issued at present, but will be used later for extending the business. The board of directors are all practical men and there is no "fancy" element about it. All experts who examine the process are satisfied with its utility and users of the products are equally pleased. There is every prospect, therefore, of the venture turning out a success. The French patents were sold some time ago to the St. Gobain Company, which is a large chemical manufacturer, but the American patents, so far as I am aware, have not been dealt with yet.

Paris. Dec. 17.

(From Our Special Correspondent.)

A meeting was held last week by the committee of organization of the proposed International Congress on Public Securities, to be held in Paris next year. About 50 members were present, and the different subjects were referred to sub-committees of three or four members to draw up monographs for discussion after consultation with competent persons desirous of taking part in the Congress. Among the subjects to be treated are statistics of public securities; Crédit Foncier institutions, railroad shares and bonds, mines and mining shares, the bourses, lottery bonds, lost or stolen securities, the rights of bondholders, the organization of free markets, conversions, taxes on public securities, failures and liquidations, markets for the account, the defence of holders of foreign securities. M. Alfred Neymarck was appointed the general reporter for the Congress.

The difficulties now existing in communications by telegraph between France and some of her colonies, which are compelled to use the English lines, has given rise to demands for the creation of a number of French submarine cables that would render France independent. The Government is disposed to take up the matter, but in the meantime a general scheme has been drawn up by a committee of members of the colonial group in the French Information Office for Foreign Trade for the most urgent lines. This comprises: 1. A cable from France to Senegal. 2. One to Madagascar and other dependencies in the Indian Ocean. 3. The purchase of the cable between Tonkin and Cochin China, and a cable from Tonkin to Amoy to join the Russian Asiatic lines. The cost of this line, it is proposed, should be borne by the Government of Indo-China. 4. A cable from Senegal to French Congo, by way of the French possessions on the Gold and Ivory Coast. 5. A line from Indo-China to Djiboute, then joining the Madagascar cable. To carry out these works will require something like 100,000,000fr. AZOTE.

DIVIDENDS.

Amalgamated Copper Company, regular quarterly of 1½% and an extra of ½% ($1,500,000 in all), payable January 22d. Total, $3,000,000.

American Cement Company, of Philadelphia, Pa., 2% regular and 1% extra, payable January 15th.

American Smelting and Refining Company, regular quarterly of 1¾% on preferred stock, payable January 9th. Total paid to that date, $1,137,500.

American Steel and Wire Company of New Jersey, quarterly of 1¾% on the preferred stock, payable January 2d.

American Zinc, Lead and Smelting Company, regular quarterly of $1, payable January 1st.

Boston & Colorado Smelting Company, of Colorado, 1½% quarterly, payable January 1st.

Delta Lead and Zinc Mining Company, of Missouri, $895, January 1st. Total to date, $4,995.

Diamond State Steel Company, 4%, January 22d.

Exploration Syndicate, regular quarterly of $2.50 per share, payable January 10th. National Carbon Company, 1¾%, payable January 15th.

Federal Steel Company, 3% on preferred, payable January 20th.

General Chemical Company, quarterly of 1½% on the preferred stock, payable January 2d.

Hecla Consolidated Mining Company of Montana, paid 50c. per share ($50,000), on December 25th. Total to date, $2,190,000.

International Zinc Company, Limited of Joplin, Mo., regular monthly of 1% ($10,000), payable January 1st.

Parrot Copper Mining Company of Montana, $1.50 per share ($345,000), payable January 10th. Total to date, $3,380,898.

Pennsylvania Steel Company, 1¾% on preferred stock, payable January 15th.

Pressed Steel Car Company of Pittsburg, Pa., quarterly of 1¾% on preferred stock, January 15th.

MEETINGS.

Name of Company.	State.	Meeting.	Date.	Place of Meeting
Alice	Mont	Annual.	Jan. 11.	Salt Lake City.
Blue Bird	Utah	"	Jan 2	Walker Bk Bld., Salt Lake City.
Boston & Tintic	Utah.	"	Jan. 9.	Central Bk, Salt Lake City.
Isabella	Colo	"	Jan. 16	Colorado Springs, Colo
Joe Bowers	Utah.	Special.	Jan. 3.	Salt Lake City
Mt. Rosa	Colo	Annual.	Jan. 9	Colorado Springs, Colo.
Mercer	Utah.	"	Jan 12.	Salt Lake City.
Valeo	Utah.	"	Jan. 8.	Salt Lake City.

ASSESSMENTS.

Name of Company.	Location.	$	Dlq.	Sale.	Amt.
Arrastraville	Cal.	4	Dec. 11	Jan. 3	.10
Brigham City Cop. & S.	Utah	1	Jan. 13	Feb. 1	.00½
Brunswick Con	Cal.	13	Dec. 19	Jan. 17	.03
Challenge Con	Nev.	28	Jan. 11	Feb. 1	.10
Chollar	Nev.	5	Jan. 11	Jan. 31	.10
Con. New York	Nev.	16	Jan. 4	Jan. 25	.03
Eureka Con. Drift	Cal.	22	Jan. 6	Jan. 27	.00½
Four Aces	Utah	...	Jan. 1	.....	.05
Galita Con	Cal.	1	Feb. 1	Mar. 5	.06
Golden Star	Cal.	...	Jan. 20	.....	.01
Gould & Curry	Nev.	88	Dec. 27	Jan. 18	.15
Grape Vine Canyon	Cal.	1	Jan. 8	Jan 29	.10
Jennie Lind	Cal.	...	Jan. 15	.....	.01
Martha Washington	Utah	3	Jan. 4	Jan. 25	.01
Mayday	Cal.	3	Jan. 9	Feb. 20	.10
Meteor	Utah	...	Dec. 18	Jan. 22	.00½
New Imperial	Utah	1	Jan. 2	Jan. 20	.01
Occidental	Nev.	34	Jan. 3	Jan. 24	.05
Opohongo	Utah	3	Dec. 14	Jan. 4	.01
Potosi	Nev.	54	Jan. 16	Feb. 7	.15
Reward	Cal.	...	Jan. 6	.....	.02½
Savage	Nev.	56	Jan. 10	Jan. 30	.10
Thorpe	Cal	...	Jan. 2	.....	.01
Yankee Con	Utah	1	Jan. 12	Feb. 12	.01
Yellow Jacket	Nev.	2	Dec. 23	Jan. 31	.15

STOCK QUOTATIONS.

NEW YORK.

NAME OF COMPANY	Location.	Par val	Dec. 22. H.	Dec. 22. L.	Dec. 23. H.	Dec. 23. L.	Dec. 25.* H.	Dec. 25.* L.	Dec. 26. H.	Dec. 26. L.	Dec. 27. H.	Dec. 27. L.	Dec. 28. H.	Dec. 28. L.	Sales
Adams.....	Colo	$10	13	...	...	...	...	...	.12	...	.12	...	...	...	...
Alamo.....	"	1	12¾	...	...	...	...	...	.16	...	.14	...	...	...	1,500
Alice.....	"	25	.35	...	...	...	...	...	.35	...	.35	...	...	...	...
Amalgamated C	Mont.	10	80.5	80.00	...	...	...	...	81.0	80 6	81.25	81.0	79.50	79.00	...
Anaconda, c	"	25	35.00	34 50	...	...	...	...	35.25	36.2	35.25	37 38	38.00	...	11,533
Anaconda Gold	Colo.	5	.45	...	...	...	...	...	.40	...	.43	...	.44	43¾	1,400
Anchoria Lel	"	1	.75	...	...	...	...	...	.70	...	.70	...	.75	.70	5000
Argentum-Jun..	"	2	.16	...	...	...	...	...	.21	...	.15	...	...	...	500
Belcher.....	Nev..	3	.12	...	...	...	...	...	.10	...	.12	...	...	...	...
Best & Belcher	"	3	.18	...	...	...	...	...	.25	...	.23	...	...	...	...
Breece.....	Colo.	25	1 50	...	...	...	...	...	1.75	...	1.75	...	...	...	...
Brit.Col.Copper	B. C..	10	9 00	8.00	...	...	...	...	9.0	8 00	10.00	9.00	10 00	9.50	...
Brunswick.....	Cal..	1	.28	...	...	...	...	...	.28	...	.24	...	...	...	...
Catalpa.....	"	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chollar.....	Nev...	3	.16	...	...	...	...	...	.1	...	.20	...	...	...	...
Consol's T at's	"	100	.64	63¾	...	...	...	...	.03	...	.04	...	...	...	1,600
" boo's	"	100	.03	...	...	...	...	...	.05	...	.03	...	...	...	...
" " scrip	"	100	.06	...	...	...	...	...	.05	...	.03	...	...	...	...
Con. Cal. & Va	"	2½	1.40	...	...	...	...	...	1.40	...	1.45	...	...	...	200
Cr & Cr. Creek	Colo..	1	.08	...	...	...	...	...	.18	...	.08	...	...	...	100
Crescent.....	"	10	.15	...	...	...	...	...	.12	...	.12	...	...	...	...
Cripple Cr. Con.	"	1	.15¾	...	...	...	...	...	.14	...	.15	...	.16	.15¾	1,600
Crown Point..	Nev. .	3	.14	...	...	...	...	...	.10	...	.14	...	...	...	...
Damon.....	Colo..	1	...	...	...	...	...	...	...	...	.10	...	...	...	...
Deadw'd Terra	S. Dak	25	.40	...	...	...	...	...	.4	...	.45	...	...	...	...
Dunkin.....	Colo .	1	.1	...	...	...	...	...	.08	...	.08	...	...	...	...
Elkton.....	Colo.	1	1.14	...	...	...	...	...	1 14	...	1.19	...	.187	...	1,000
Eureka.....	Nev..	20	.2	...	...	...	...	...	.25	...	.25	...	...	...	...
Father de Smet	Dak...	100	.7	...	...	...	...	...	.07	...	.0	...	...	...	200
Findley.....	Colo	1	.12½	...	...	...	...	...	.14	...	.15	...	...	...	1,000
Garf Con.....	"	1	.06	...	...	...	...	...	.10	...	.16	...	.17¾	.16½	1,600
Golden Age.....	"	1	...	...	...	...	...	...	...	...	...	...	...	...	1,0 0
Golden Fleece..	"	1	.28	...	...	...	...	...	.2	...	.2	...	.27½	.25	1,000
Gould & Curry	Nev .	3	...	...	...	...	...	...	.20	...	.20	...	...	...	...
Hale&Norcross	Nev	3	.37	...	...	...	...	...	.35	...	.3	...	...	...	...
Homestake	S. Dak	100	...	...	...	...	...	...	55.0	...	65.0	...	...	...	...
Horn Silver ...	Utah..	25	1.00	...	...	...	...	...	1.0	...	1.0	...	...	...	...
Iron Silver..	Colo.	20	.50	...	...	...	...	...	.51	...	.5	...	...	...	...
Isabella	"	1	1.4	...	...	...	...	...	1.30	...	1.4	...	...	...	1,000
Jack Pot.....	"	1	.58	...	...	...	...	...	.5	...	.57	...	...	...	...
King & Pemb.	Ont..	10	.35	...	...	...	...	...	.30	...	.35	...	...	...	3.0
Lacrosse.....	Colo..	10	.14	...	....	...	...	...	.14	...	.14	...	...	...	...
Leadville Con..	"	10	.0	...	...	...	...	...	.7	...	.08	...	...	...	100
Little Chief	"	5	.15	...	...	...	...	...	.17	...	.18	...	...	...	...
Mexican.....	Nev..	3	.30	...	...	...	...	...	.33	...	.3	...	...	...	300
Mollie Gibson.	Colo .	5	.24	...	...	...	...	...	.2	...	.20	...	.24	.2	3,0 0
Morenci Cop.pf	"	1	1.8	...	...	...	...	...	1.94	...	1.9	...	2.05	1.96	1,9 0
Mouiton.....	Mont	25	.50	...	...	...	...	...	.3	...	.35	...	...	...	...
Mt. Rosa	Colo..	...	.46	...	...	...	...	...	.4	...	.4	...	...	...	...
Occidental.....	Nev.	3	.09	...	...	...	...	...	.08	...	.10	...	...	...	...
Ontario.....	Utah	10	7.00	...	...	...	...	...	8.00	...	7.75	...	...	...	110
Ophir.....	Nev .	3	.67	...	...	...	...	...	.75	...	.6	...	...	...	1.0
Pinnacle	Colo..	...	.26	...	...	...	...	...	.26	...	.26	...	...	...	...
Pharmacist..	"	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Phoenix	Aris..	1	.10	08	...	...	...	...	.08	...	.08	...	...	...	500
Plymouth Con..	Cal.	10	.08	...	...	...	...	...	.08	...	.18	...	...	...	...
Portland.....	Colo.	1	2.30	...	...	...	...	...	2 3	...	2 26	...	...	...	...
Potosi.....	Nev..	3	.20	...	...	...	...	...	.20	...	.2	...	...	...	...
Quicksilver....	Cal..	10	1 5	...	...	...	...	...	1.5	...	1.00	...	...	...	100
do. pref.....	"	10	7 50	...	...	...	...	...	7.00	...	7.50	...	...	...	...
Savage.....	Nev...	2½	.08	...	...	...	...	...	.05	...	.08	...	...	...	...
Sierra Nevada.	"	3	.4	...	...	...	...	...	.4	...	.7	...	...	...	...
Small Hopes..	Colo..	20	.9	...	...	...	...	...	.95	...	9	...	...	...	...
Specimen.....	"	1	.11	...	...	...	...	...	.09	...	.08	...	...	...	2,0 0
Standard Con..	Cal .	1	2.4	...	...	...	...	...	2.20	...	2.30	...	...	...	...
Tenn Copper..	Tenn	11	12 00	11.0	...	...	...	...	12 0	...	12.50	11.75	13.00	12.0	...
Tornado	Colo.	1	.45	...	...	...	...	...	.45	...	.44	...	...	...	...
Union	"	1	.34½	.32	...	...	...	...	.34	...	.33	...	.36½	.36¼	.400
Union Con.....	Nev..	2½	.2	...	...	...	...	...	...	...	.2	...	...	...	...
Utah Con.....	"	3	.06	...	...	...	...	...	.03	...	.03	...	...	...	...
Work.....	Colo	1	.28	...	...	...	...	...	.29¼	...	.3	...	.28¾	.28¼	3,000
Yellow Jacket.	Nev..	3	.09	...	...	...	...	...	.10	...	.2	...	...	...	...

COAL AND INDUSTRIAL STOCKS.

Am. Sm. & Ref.	.....	$100	30⅝	30	...	...	...	...	34	32	35¾	35	35¾	...	7,115
" " " pf	.....	100	8 ⅜	81	...	...	...	...	85	84	85	84¾	86	...	3,537
Am.S &W Co n	.....	100	4	38¾	...	...	...	...	44⅜	42¾	44¾	44⅝	46¼	...	14,125
" pf'rn	.....	100	88	84	...	...	...	...	88	87	89¾	88	9	...	8,251
Central of N J	N. J..	100	112	110	...	...	...	...	114	...	116¾	114¾	115¾	...	2,595
Col. C. & I. Dev	Colo..	100	...	...	...	...	...	...	...	...	...	...	...	...	...
Col. Fuel & I..	Colo..	100	...	...	...	...	...	...	39¾	38	40¾	39	42	...	15,500
Col. & H C.&I	Colo..	100	13	12¾	...	...	...	...	15¾	15	...	...	...	...	550
Del. & Hud	N. Y.	100	113	11 ⅜	...	...	...	...	115	14	1 14¾	...	116¾	...	3,785
Federal Steel..	.....	100	44	41¾	...	...	...	...	47¼	45	50⅜	47	50⅝	...	79,836
" " pf	.....	100	70	67	...	...	...	...	70⅜	69	72⅝	70⅜	7 ⅜	...	15,91
National Lead.	N. Y	100	23¼	2 ⅜	...	...	...	...	24⅞	...	25⅜	24⅜	25¼	...	1,925
" " pf	Md..	100	104¾	...	...	...	...	...	...	...	104¾	...	104¾	...	6.4
National Sa't.	.....	100	43	42	...	...	...	...	46	43	46¾	45	47	...	...
" " pf	.....	100	77	75	...	...	...	...	77	75	80	78	79	78¾	...
N. Y., Ont. & W.	N. Y.	100	31¾	29	...	...	...	...	21	20¾	22	21¾	21¾	...	28,765
Reading, 1st pf	Pa....	10	46	42¾	...	...	...	...	47¾	45¾	49	47¼	49 ⅜	...	28,025
" 2d pf.	" ...	10	24¾	22¾	...	...	...	...	25¾	25	27⅜	25	27½	...	7,370
Republic I & S.	"	10	18	16¾	...	...	...	...	19	18¾	20	19	19¾	...	8, 89
" " pf	"	10	6 ¾	6¼	...	...	...	...	64	63	65	64¾	64¾	...	1,965
Stan.Oil of N J..	N J..	10	454	451	...	...	...	...	450	...	4 9	451	460	456	...
Tenn C.I.&R.R.	Ala	100	75	69¾	...	...	...	...	79¾	78¾	88	79¾	83¾	...	16,500

§ Ex-dividend * Holiday.

PHILADELPHIA, PA.

NAME OF COMPANY.	L'cation.	Par Val.	Dec. 21. H.	Dec. 21. L.	Dec 22. H.	Dec 22. L.	Dec. 23. H.	Dec. 23. L.	Dec. 25.* H.	Dec. 25.* L.	Dec. 26 H.	Dec. 26 L.	Dec. 27. H.	Dec. 27. L.	Sales
Am. Alkali	.....	...	2 63	...	2.50	...	2.50	...	...	...	2.5	...	...	...	1,765
" " pf.	.....	...	1.25	...	...	...	...	...	...	...	...	...	...	...	1 0
Bethlehem Irn	Pa.	...	...	...	58.0	...	...	...	...	...	...	...	57.50	57 0	213
Bethlehem St'l	"	$50	7.00	6.50	...	...	...	...	...	...	17.88	17.50	...	...	110
Cambria Iron.	"	50	43 00	...	43.50	42.50	42.50	42.25	...	...	12 00	...	...	...	844
Cambria Steel	I.T.	50	18.63	17.75	18.25	17.50	19.00	18.25	...	...	19.50	19.18	20.0	9.50	20,843
Choctaw Pref.	Pa.	50	42.00	41.50	...	...	42 00	41.50	...	...	...	...	44.00	43 00	400
Lehigh Val....	"	50	24 13	23 63	23.50	22 13	22 75	...	...	...	24 0	23.50	...	...	6,9 9
Penna. R. R.	"	50	65.25	64.75	65.0	64.25	65.25	64 88	...	...	65.38	64.25	61.88	61.00	5,796
Susq I & S.	"	.....	4 50	4.25	4.38	4.00	...	...	...	...	...	...	4.50	...	1,24
United Gas I.	"	50	147	145	144¾	132⅝	140	137	...	...	143¾	1 40	148	145	7,2 0
Welsb. of Can	Can.	100	...	...	...	...	...	...	...	...	...	...	...	...	...
Welsb. Comi.	"	100	...	...	...	...	...	...	...	...	...	...	...	...	...
Welsb I bnt.	"	100	36.0	35 00	35.13	35 0	37.0	36.00	...	...	38.0	...	36.0	...	2,035

Total shares sold, 57,249 * Holiday

SALT LAKE CITY, UTAH.* Dec. 22.

STOCKS.†	No of shares	Par val.	Bid.	Asked.	STOCKS.†	No of shares.	Par val.	Bid.	Asked
Ajax.....	300,000	$10	$0 55	$0.95	Homestake.....	400,000	$1	...	$0 15
Alice.....	400,000	25	.30	.75	Horn Silver.....	400,000	25	$0.90	1.45
Anchor.....	150,000	10	...	...	Joe Bowers	400,000	1	.13¾	.14
Buckeye.....	500,000	1	.02¾	.04¼	Little Pittsburg..	400,000	5	.03¾	.05
Bullion-Beck & Ch.	100,000	10	2.80	3.50	Lower Mammoth	150,000	1	.61	.63¾
Centennial Eureka	30,000	50	...	...	Mammoth	400,000	5	2 73	2.76
Colorado Point.	500,000	1	.12½	.14	Mercur.....	200,000	25	6 85	6.80
Daisy..	500,000	3	.12½	.13¾	Northern Light..	400,000	5	17¾	17¾
Dalton.....	500,000	5	.0 ⅜	.02¾	Omaha	300,000	2	...	...
Dalton & Lark....	2,500,000	1	.05	06	Ontario.....	150,000	100	8.00	9 10
Daly.....	150,000	20	1 40	1.79	Richmoud-An..	500,000	1	.20	21
Daly West.....	150,000	20	12.06	12 25	Sacramento	1,000,000	5	2¾	2¾
Dexter.....	200,000	5	2.47	2.56	Silver King.....	150,000	20	53 10	54.00
Eagle.....	150,000	1	...	...	Star Consolidat'd	500,000	1	.25	.25
Eagle & Blue Bell.	250,000	1	1 37½	1 43¾	Sunbeam.....	250,000	1	.54	56
Emerald	300,000	1	.03	.07	Sunshine.....	250,000	10	15	23
Four Aces.....	250,000	1	.04¾	.05¾	Swansea	100,000	5	3 60	4 00
Galena	100,000	10	.25	.3½	South Swansea..	150,000	1	1 30	1 9¼
Geyser-Marion.....	300,000	5	23	26	Utah	100,000	1	.69	.72¾
Grand Central	250,000	1	5 99	6 00	Valeo	200,000	10	80	...

*From Our Special Correspondent. † Utah companies. § Mines in Vanderbilt, Cal. Mines in Tuscarora, Nev.

BOSTON, MASS.†

NAME OF COMPANY.	Par val.	No. of shares.	Dec. 21. H.	Dec. 21. L.	Dec 22. H.	Dec 22. L.	Dec. 23 H.	Dec. 23 L.	Dec. 25.* H.	Dec. 25.* L.	Dec. 26. H.	Dec. 26. L.	Dec. 27. H.	Dec. 27. L.	Sales
Aetna, cons. g.	$25	100,000	...	...	6 00	...	...	...	...	...	...	...	...	...	...
Advent'e.Cons	25	100 000	6.50	.....	6 00	...	...	...	...	...	...	...	7.0	6 50	260
Allouez.....	25	80,000	3.00	.....	3 00	...	...	...	...	...	...	...	3 50	3.00	150
Am. Z. L. & S.	25	1,200,000	17.00	.....	17 00	15.00	17 00	16.00	...	...	17 00	...	...	...	1,98
Anaconda	25	1,200,000	35.00	.....	...	...	35 13	...	...	...	37 50	...	...	...	155
Arcadian, c....	25	150,000	23.75	22.00	23.00	22.00	23.00	...	...	...	25 50	22 00	25 00	22.50	1,234
Arnold, c.....	25	60,000	5.50	...	5 50	5.00	...	...	...	...	5.50	4.50	4.50	5.00	2,885
Ashbed	25	400,000	...	...	...	...	...	...	...	...	...	...	...	...	...
Atlantic, c....	25	40,000	3.5	...	3.50	3 0	3.00	...	...	...	...	...	25 00	3.00	250
Baltic, c.....	25	100,000	18 0	17.50	18 00	17.0	16.88	6 50	...	...	18 00	16.50	17.50	...	535
Bingham, c &g.	10	190,000	10.75	10 00	10.50	10.00	10.50	10 13	...	...	10.13	10.00	...	...	1,325
Bonanza, g....	10	300,000	1 00	...	...	...	...	...	...	...	...	...	...	...	520
Boston, c.....	10	100,000	...	...	...	...	...	...	...	...	...	...	...	...	...
Boston&C C	2	200,000	...	...	...	...	...	...	...	...	...	...	...	...	...
Bos. & Mon, Tr R	25	150,000	265	261	260	255	260	257	...	...	258	...	265	255	50
Breece	25	20,000	...	...	...	...	...	...	...	...	...	...	...	...	911
British Col..	5	200,000	...	...	...	...	...	...	...	...	...	...	...	...	...
Butte & Bost., c	10	200,000	45.00	41.00	41.50	40.00	43.0	42 00	...	...	42.00	...	45 00	42.00	566
Cal. & Hecla, c.	25	100,000	725	7.0	7.25	7.5	7.15	...	...	...	720	715	749	710	72
Centennial, c.	25	27,000	17 00	5.50	16 00	15 00	17.00	15.25	...	...	16 25	16.00	16 50	15 50	1,826
Central Oil..	25	79,720	19.0	...	18.75	18.5	...	...	...	...	19.0	...	...	...	235
Cochiti, g.....	10	150,000	12.50	12.00	12.25	11.75	11.75	...	...	...	12.00	11.50	...	...	1,410
Cont. ZL Mg&Sm	10	110,000	...	...	...	...	...	...	...	...	...	...	...	...	...
Copper Range..	10	100,000	30.50	...	29.00	...	30.00	29.00	...	...	29.0	...	...	...	435
Crescent, s ..	1	300,000	...	...	...	...	...	...	...	...	...	...	...	...	...
Dominion Coal.	100	150,000	42 0	41 25	42.00	40.50	42.00	41.75	...	...	44 50	42.00	...	...	2,480
do. pref.	100	30,000	114	...	...	...	1 8	...	...	...	...	...	...	...	25
Elm River Mg..	10	100,000	4.75	4 5	4 25	4.0	4 30	...	...	...	...	...	...	...	850
Federal Steel.	100	464,843	45.5	44.0	43.75	40.75	45.50	44.5	...	...	48.0	45.00	...	...	2,762
do. pref	100	532,600	71 0	70.0	70 00	67 00	70.0	69.00	...	...	70.00	...	...	...	772
Franklin, c....	25	100,000	14 5	3 2	13.7	3.00	13.00	12 50	...	...	13 50	...	13.25	13.0	1,280
Humboldt	25	40,000	...	...	...	...	...	...	...	...	...	...	...	...	...
L Royal Con. c.	25	100,000	24.00	23.25	24 00	23 00	23 00	...	...	...	5.0	21.00	24.75	...	797
Mass. Con.....	25	100,000	9 00	...	9.00	...	9.00	...	...	...	10.00	9 50	...	...	300
Mayflower.....	...	...	3.0	...	...	2.15	...	...	...	...	...	...	...	...	200
Melones	10	167,577	1.75	...	1 80	...	1 50	...	...	...	...	...	...	...	700
Merced, g	15	100,00	3.00	...	...	...	9.00	8.50	...	...	10.00	...	...	...	855
Michigan.....	25	100,0 0	7.00	...	...	...	...	...	...	...	6.75	...	...	...	250
Mohawk, c	25	100,000	16 00	15.00	15.25	14 75	15 00	...	...	...	15.00	...	15.00	4.50	1,040
Montana C &C	25	200,000	8.50	8.00	...	...	...	...	...	...	...	...	...	...	110
New Iorla	5	100,000	...	...	...	...	9.75	...	...	...	9.75	...	...	...	250
N.A Gold Dre's	10	100,000	2 50	2.00	2.00	...	...	...	...	...	2.00	...	...	...	675
Old Colony, c	25	100,000	5 0	4 5	4.50	4 2	...	...	...	...	5 00	4 00	5 00	4.00	580
Old Dominion, c	25	150,000	20 00	19 00	18.50	17.50	18 13	18 00	...	...	19 00	18 50	9.50	...	2,661
Osceola, c.....	25	93,000	69 0	66.00	67 0	64.00	66.50	65 25	...	...	68 00	67.0	69.00	67.50	1,497
Parrot, s c	10	229,385	36.50	35.25	36.50	35.0	36.50	35.5	...	...	39 00	36.50	37.00	36.50	3,442
Ph neer, g.....	10	100,000	...	...	...	...	...	...	...	...	...	...	...	...	...
Quincy, c	25	100,000	135	...	35¼	135	135	...	...	...	...	...	146	137¾	105
Rhode Island	25	100,000	5 00	...	5 00	4 25	5 00	4.75	...	...	...	...	5 00	...	225
Santa Fe, g. & c	10	250,000	5.50	5.00	5.50	4 25	5.50	5 00	...	...	5 25	5.00	5.00	4.75	1,350
San. Ysabel, g..	5	130,000	7 38	7 00	7.00	...	7.00	...	...	...	...	...	7 50	7.00	595
Tamarack, c...	25	60,000	179	178	175	173	...	...	...	...	174	173	170	156	105
Tecumseh.....	25	80, 0	...	...	3.75	...	...	...	...	...	...	...	...	...	50
Tri Mountain..	25	100,000	7.00	...	7.00	6.00	7.00	...	...	...	6.50	6.38	...	...	585
Union C L	25	80,000	...	...	...	...	...	...	...	...	...	...	...	...	...
United States .	25	250,000	...	...	...	...	...	...	...	...	...	...	...	...	...
U. S. Oil	25	100,000	27.00	25 13	25.00	23.00	24.25	23.00	...	...	23.25	20.25	...	...	7,151
Utan Cons,g &c	5	3 0,00	28 88	28.50	28.00	24 00	24 00	2 .00	...	...	26.00	25.00	27.00	26.50	1,000
Victoria	25	100, 0	3.50	....	4.0	3.00	...	...	...	...	...	...	...	...	60
Washington ..	25	40,000	...	...	1.00	....	...	...	...	...	...	...	1.13	....	1,300
White Knob ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Winona, c....	10	50,000	5.50	5 88	5.0	4 50	...	...	...	...	...	...	5 50	4 50	500
Wolverine, c...	25	60,00	34.5	37.0	38.00	37 00	37 00	...	...	...	37.00	...	37.50	37.00	1,018
Wyandotte	25	100,0 0	2 2	2.00	...	...	1 75	1.50	...	...	2. 0	...	...	...	380

Official quotations Boston Stock Exchange. Total sales, 30,174. *Holiday.

COLORADO SPRINGS, COLO.‡

NAME OF COMPANY.	Par val	Dec. 18. B.	Dec. 18. A.	Dec. 19 B.	Dec. 19 A.	Dec 20. B.	Dec 20. A.	Dec. 21. B.	Dec. 21. A.	Dec 25.* B.	Dec 25.* A.	Dec. 26. B.	Dec. 26. A.	Sales.
Alamo.....	$1	.15	.15¾	.15¾	.16¼	.16	.17	.16	...	...	...	.15¾	.16	18,*00
Anaconda	1	.41	.43	.40¾	.41¾	40	.41	41¾	.42¼	...	...	43	44	11,000
Arg'ntumJ	1	.17	.19	.19	.19¾	.18¾	19¼	18	...	...	...	18	.18¾	6,300
Cadillac...	1	.0 ¾	02	.01¾	.02	.01¾	.02¼	.01¾	.02¾	...	...	...	...	5,00
C. C. Con...	1	.14¾	.15	.15¾	.15¾	.15¾	.15¾	.15¾	.15¾	...	...	15	.16¾	20,500
Dante.....	1	.16¾	.17	.15¾	.17¾	.16¾	.17¾	.17¾	.17¾	...	...	...	...	40,500
ElktonCon	1	1.14¾	1 18	1.15¾	1.16¼	1.14	1 15	1 14	1.16	...	...	1.19	1.20	18,100
El Paso G..	1	.30	32	.30	.29¼	.32	29	...	...	...	...	29	.32	5,900
Favorite...	1	05¾	06¾	.05¾	.05¾	.05¾	.05¾	.05¾	...	...	...	...	...	16,000
Findley	1	.13	13¾	.13¾	.14	13¾	.13¾	13¾	...	...	...	.13¾	.13¾	4,000
Golden Fl	1	...	...	...	.12	.25	...	.25	.31	...	...	25	.30	300
Gold Hill	1	.02¾	.02¾	.02¾	.03¼	.03¼	.03¾	.03¾	.02¾	...	...	...	...	3,785
ing. Con....	1	.13	.13¾	.13¾	.13¾	13¾	...	13¾	.13¾	...	...	...	...	4,000
Isabella.....	1	...	1.36	1.39	1.40	1 39¾	1 40	1 45¾	1 46	...	...	...	...	7,500
Jack Pot..	1	.61	63¾	.61¾	62	.54	.52¾	.55	.57	...	...	56	.57¾	43,039
Lexington.	1	.23¾	.24	.24¾	2	.24¼	.24¾	.24¾	.25	...	...	...	...	14,000
Magnet R	1	04¾	.04	.04¾	.03¾	03¾	04¼	.03¾	.03¾	...	...	...	...	3?,500
Matoa.....	1	24¼	.27	.24	.27	...	.28	.27	...	...	...	.29¼	.31	27,100
Midway.....	1	05¾	.06¼	.0 ¾	05¾	05¾	.05¾	.05¾	...	...	...	...	...	5,50
Mobile	1	.03¾	.04	.03¾	.04	.03¾	.04	...	.03¾	...	...	...	...	28,5.0
Mollie Gib.	1	...	...	...	...	.20	.25	...	.24½	...

STOCK QUOTATIONS.

DENVER, COLO.†

Name of Company.	Par val.	Dec. 16 B.	Dec. 16 A.	Dec. 18 B	Dec. 18 A.	Dec. 19. B	Dec. 19. A.	Dec. 20. B	Dec. 20. A.	Dec. 21. B.	Dec. 21. A.	Dec. 23 B.	Dec. 23 A.	Sales.
Mines.														
Anac'da G..	$5	44⅜	.....	.40	.....	18	.42½	40¾	.....	.41⅛	.19	.40¾	.....	.....
Atz. J.....	1	.....	.....	.8	.19	.....	.....	.....	.....	.....	.....	.18¾	.....	.....
Bankers.....	1	.....	.12⅜	.....	.....	.10¾	.12	.....	.12	.11	.11⅜	.1.	.....	500
CrippleC.C.	1	.....	.....	.....	.16¼	.15	.15⅜	15⅜	.....	.....	11	.....	.15	.15⅜	.....
Della S	1	.....	.....	.....	.....	.....	.....	.....	.06¾	.....	.....	.....	.....	.....
Elkton Con	1	1.52	..	.....	.....	.....	1.16	.....	.....	.....	.....	.....	.....	.....
Findley....	1	.. ..	.....	.13	.....	.....	.....	.....	.....	.....	.....	.....	.17¾	.....
Garf. Con..	1	.....	.20	.....	.....	.16	.....	15	.17	.....	.....	.....	.....	.....
Gold Coin.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Goldstone.	1	.....	.....	.02¾	.02¾	.02	.....	.02¾	.02½	.0.¾	.02½	.02¾	.....	5,000
Indepnd'nc	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ironclad..	1	.04¾	.....	.04¾	05	.....	.....	.05¾	.....	.....	.....	.04¾	.....	.....
Isabella....	1	1.46	1.47	.....	.....	.....	.....	1.42	1.43¾	.....	1.43¾	.....	.....	500
Jack Pot...	1	.. ..	.63	56	.....	.....	.....	.....	.....	.....	.....	.....	.44¾	.....
Jefferson..	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.07	.09¾	.....
Keystone ..	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
LosAngeles	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mollie Gib.	5	.21¾	.....	.20¾	.....	.20	.....	.....	.....	.20	.....	.20½	.....	.....
NewZealnd	1	.40	.....	.....	.41	.....	.47	.....	.....	.40	.50	.....	.55	.....	500
Ophir	1	.....	.....	.55	.60	.....	.45	.....	.....	.....	.....	.....	.60	.....	.....
Pharmacist	5	.....	.....	.14	.....	.....	.....	.....	.14¾	.....	.....	.....	.44¾	.....	.....
Portland..	1	2.31	.....	.....	.....	2.35	.....	.....	.....	.....	.....	.....	.....	.....	.....
Specimen..	1	.10	.11¾	.....	.10¾	.10¾	.....	.10¾	.10¾	.....	.10¾	.....	.....	.....	.....
Union Gold	1	.....	.86	.31¾	.35¾	.34	.....	.34	.....	.....	.....	.....	.....	.....	50
Vindicator.	1	1.75	.....	.....	.....	1.65	.....	.....	.....	.....	.....	1.75	.....	.....	.....
Work	1	.....	.....	.29	.29¾	.28¾	.....	.....	.....	.28	.....	.....	.....	.....	.....
Prosp'cts.															
C C Imp ...	1	004	.005	.....	.003	004¾	.003	.0 4	.025	.04	0 5	.004	005	5,000
Illinois	1	.01	.....	.009¾	.....	.01	.0 ¾	.01	.0.¾	.01	.015	.0.9¾	.....	23,000
Old Gold...	1	.01¾	.02	.0.¾	.03¾	.01¾	.0 ¾	.....	.....	.01¾	.....	.02¾	.02¾	22,0 0
Puritan ..	1	0.¾	.02¾	.02¾	.02¾	02	.02¾	.03¼	.03¼	.02¾	.02¾	.....	.....	49,000
Miscell.															
Acacia.....	1	.....	.....	.....	.....	.....	.35¾	.....	.....	.....	.....	.....	.....	.....	.....
Alamo.....	1	.....	.16¾	.....	.15¾	.14¾	.....	.15¾	.....	.....	.17¾	.....	.....	.....	.....
Aol	1	.....	.4	.....	.....	.35	.....	.....	.....	.05¾	.06	.05¾	.05¾	.....	.....
Battle Mt..	1	.35	..	.33¾	.....	.....	.....	.32	.....	.....	.....	.....	.....	.....	.....
Bob Lee ..	1	.05¾	.....	.....	.....	.....	.....	.07	.08	.....	.....	.....	.....	.....	.....
C C. & M...	1	.....	.....	.....	.17¾	.6	.....	.....	.16¾	.15¾	.16¾	.....	.....	.....	.....
De Beers ..	1	0.9	..	0 4	.....	.09	.....	009	.....	009	.....	.009	.....	.....	.....
Des Moines	1	.....	.05¾	.....	.06	.....	.....	.....	.03¾	.....	.03¾	.05	.....	.....	.....
Favorite....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
G'ld'n Eagle	1	.....	.....	.....	.....	.....	.....	.....	.....	.62	.....	.....	.....	.....	.....
Gr'nite Hill	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Magnet R ..	1	.....	.0.¾	.....	.....	.....	.....	.04¾	.....	.04	.....	.04¾	.....	.....	.....
Mobile.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mt. Beauty.	1	.11¾	.....	.11¾	.....	.....	.....	.10¾	.....	.....	.11¾	.10	.....	.....	1,000
Trachyte...	1	.....	.....	.....	.....	.....	.06¾	.....	.....	.....	.....	.....	.....	.....	.....

† Official Quotations Denver Stock Exchange. Total sales, 105,600 shares.

SAN FRANCISCO, CAL.

Name of Company.	Location.	Par. value.	Dec. 21.	Dec 22.	Dec. 26.	Dec. 27*	Dec. 28.	Dec. 29.
Alpha Con.....	Nev.	1.00	.03	.04	.03	.....	.03	.03
Alta.....	"	2.00	.18	.08	.04	.....	05	. 6
Andes.....	"	3.00	.12	.11	.11	.....	.10	.10
Belcher.....	"	3.00	.16	.15	.14	.....	.14	.14
Best & Belcher.....	"	3.00	.29	28	.28	.....	26	26
Bullion.....	"	1.00	.04	03	.03	.....	.03	03
Caledonia	"	3.00	.53	51	.51	.....	.49	.49
Challenge Con.....	"	3.00	13	.11	.11	.....	.12	. 0
Cholar	"	3.00	20	.19	.8	.....	.22	.21
Confidence.....	"	3.00	.66	.65	.70	.....	.65	.65
Con. California & Virginia..	"	2 50	1.50	1.50	1.50	.....	1 40	1 45
Cons. Imperial.....	"	1.00	.02	.01	.01	.....	.01	.01
Crown Point	"	3.00	.14	.12	13	.....	.13	.13
Gould & Curry.....	"	3.00	.12	.10	.25	.....	.24	22
Hale & Norcross	"	3 00	.35	37	38	.....	33	.35
Julia Con.....	"	1.00	.02	.02	.04	.....	.04	.04
Justice.....	"	2.00	.04	.04	.04	.....	03	.03
Kentuck Con.....	"	1 00	.01	.02	.01	.....	02	.02
Mexican.....	"	3.00	.31	.31	.30	.....	.28	.8
Occidental Con.....	"	3.00	.12	11	.11	.....	1.	.11
Ophir.....	"	3.00	72	.70	71	.....	.66	.68
Overman	"	2.00	11	10	.10	.....	.10	.10
Potosi.....	"	3.00	.25	19	.18	.....	.22	24
Savage.....	"	2 50	.10	09	.19	.....	.09	.18
Seg. Belcher & M.....	"	2.00	.03	.03	.03	.....	02	.03
Sierra Nevada.....	"	3.00	.43	44	43	.....	40	.41
Standard.....	Cal.	10.00	2.50	2 50	2.35	.....	2 30	2.30
Union Con....	Nev.	2.50	.25	25	.25	.....	24	.26
Utah Con	"	1.00	.04	.04	.05	.....	.04	.04
Yellow Jacket.....	"	3.00	.10	.23	.23	.....	21	.24
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....

Official telegraphic quotations of San Francisco Stock Exchange * Holiday.

TORONTO, ONT.*

Name of Company.	Par val.	Dec. 19. B.	Dec. 19. A.	Dec. 20. B.	Dec. 20. A	Dec 21. B.	Dec. 21. A.	Dec. 22 B.	Dec. 22 A.	Dec. 23. B.	Dec. 23. A.	Dec. 25. B.	Dec. 25. A	Sales.
Ontario.														
Alice A ..	$1	.08	.11	.08	.12	.08	.11	.08	.11	.08	.10	.....	.....	.....
Empress ..	1	02¾	03¼	02	.03¼	2	03	.02	.08	02	.3	.....	.....	.....
Golden Star	1	.30	32	.30¾	.32	.3	.3 ¾	30	.3.¾	.30	.32	.....	.....	5,500
Ham Reef..	1	.13	.18	.12	.18	.0	.18	.12	.18	.12	.18	.....	.....	.....
...ritish Col..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Athabaska..	1	.30	.35	.30	36	30	35	31	.36	3.	.35	.....	.....	1,000
Br'd'n&G.J.	1	.2.	.30	25	.30	.24	.28	.22	.27	.24	.27	.....	.....	.....
Crow's N C.	5	36.00	36.50	37 50	38 00	30 00	36.00	30 00	35.00	3 .00	35.00	.....	.....	10
Dardanelles	1	.14	. 2	.09¾	.11¾	.09¾	.11	.10	.1.¾	.10¾	11	.....	.....	.....
Deer'f'lNo 2	1	.10¾	.12	.11	.13¾	11¾	.14	.11	.13¾	.11	.13¾	.....	.....	6,500
Evan'g star	1	.07¾	09	06	.09	05	08¾	.06	.09	07	.0.¾	.....	.....	.....
Fairview C	1.25	.02	.05¾	.3	.05¾	.02¾	05¾	04	.6	04¾	.06	.....	.....	.....
Insurgent .	0.10	02	.05¾	.02	.04	.02	.04	02	.04	02	04	.....	.....	.....
Iron Mask..	1	.58	65	.52	64	.53	.65	61	.....	.63	.....	.....	.....	.....
Jim Blaine	1	.21	.25	.20	26	.22	.26	23	.26	.24	.26	.....	.....	.....
Minnehaha.	1	.12	.14¾	.12	15	.10	.15	12	.14¾	.12	.14	.....	.....	.....
Mont Cristo	1	03¾	03¾	05¾	.07	.03¾	.07	05¾	.06	.05	.07	.....	.....	500
Mont.&Lon.	0.24	.16	19	14	39	.25	.38	34	.37	.34	.36	.....	.....	2,000
Morrison...	1	.05	.10	.05	12	.01¾	.09	.6	.10	.6	.11	.....	.....	.....
Noble Five.	1	.12	.18	.11	18	.12¾	.18	12	.18	13	.18	.....	.....	.....
No Belle...	1	.01¾	.02¾	.01¾	.02	.01¾	.01¾	01¾	.02¾	.01	.02¾	.....	.....	8,*0
Rambler ...	1	.56	.59	.56	.60	.56	.9	.55	.59	.56	.8¾	.....	.....	.....
Republic...	1	.94	1.02	1 03	1.12¾	1 04¾	1.13	1. 5	1.09	1 06	1.08	.....	.....	2,8 0
Van Anda..	1	03¾	03¾	.04	.15¾	.03	.6	.05¾	.06	.05	.06	.....	.....	6,000
Victory Tri.	1	.02¾	.05	.05	.05	.18	.05	.0.¾	.05	.03	.05	.....	.....	.....
Virtue	1	.36	.39	.51	.59	.3.	.38	.5.	54	.50	.53	.....	.....	.....
War Eagle..	1	2.40	2 55	2 .0	2.6.	2 45	2.61	2.43	2.48	2.*0	2.5.	.....	.....	2.
Waterloo..	0.10	.10	13¾	.10¾	.13¾	.10¾	13¾	.12¾	13¾	.12¾	13¾	.....	.....	.....
White Bear.	1	.03	.04	.03	05¾	.03	.04	.03	.04	.03	.04	.....	.....	3,000
Winnipeg..	1	.26	.30	.25	.31	.24	.31	.29	.31	.27	.30	.....	.....	.....
Develop Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
B.C.G.Fields	1	.03	.04	.03	.04	.03	.03¾	03	.04	.03	.04	.....	.....	1,000
Can. G. F.S.	0.10	.06	08	.06¾	.07¾	.05¾	07¾	.08	.07¾	.06¾	.07	.....	.....	8,0 0
Gold Hills..	1	.04	.05	03¾	.05	.03	.05	.03¾	.05	.04	.05¾	.....	.....	1,000

* Official quotations of the Standard and Toronto Mining and Industrial Exchanges. Total shares sold, 45,833.

MEXICO.

Dec. 15.

Name of Company.	No. of shares.	Last div'd.	Prices. Op'g	Prices. Cl'g.	Name of Company.	No. of shares.	Last div'd	Prices. Op'g.	Prices. Cl'g.
Chihuahua:					Hidalgo:				
Gloria.....	1,500	.....	$50	$50	Real del Monte..	2,554	10 00	520	550
Durango:					San Francisco Hc	6,000	3.00	220	225
Barradon y Cab ...	2,400	.....	40	40	San Rafael y An.	1,200	12.00	1,000	1,020
Candelaria de Pan.	1,200	.....	20	20	do. aviado	1,200	6.00	400	410
Capusaya.....	2,400	.....	30	30	do. del Oro.....	3,000	5 00	20	20
Penoles.....	2,500	30.00	2,000	2,000	Soledad..... ..	960	5.00	300	330
Restauradora.....	10,000	.....	20	20	Sorpresa..... .	960	7.50	260	300
Rosario y Anexas.	4,800	.....	10	10	Union Hacienda.	2,000	5.00	350	340
Guanajuato.					Mexico:				
Angustias.....	2,400	5.00	225	230	Coronas.....	500	.....	75	75
Cinco Senores y An	2,000	15.00	390	380	Esperanza y An..	3,000	10.00	1,380	1,360
El Oro.....	500	.....	30	30	Michoacan				
do. pref.	2,000	.....	30	30	Luz de Borda ava	4,000	.....	30	22
Guadalupe Hacie'a	10,000	2.00	240	235	Pueblo:				
Trinidad, aviador .	2,000	.....	25	25	Tlauuingo..... ..	2,400	.....	27	28
do. aviada.....	400	.....	25	20	S. Luis Potosi:				
Zona Minera de Pas	2,400	.....	25	28	Concep. y An.	2,400	.....	230	240
Hidalgo:					Sta.MariadelaPaz	2,400	10 00	720	840
Amistad y Concord.	9,600	1.47	28	29	Zacatecas:				
Arevalo	720	.....	200	200	Asturiana y An..	3,500	10.00	260	250
Bartolome de Med.	2,000	2.00	65	70	Cabezon	2,400	.....	15	15
Carmen.....	1,100	7.75	300	300	Tiolelar. de Pinos.	2,500	.....	80	100
Luz de Maravillas..	900	.....	120	100	Palma de Somb..	2,400	.....	100	80
Pabellon.....	800	27.60	90	20	.. .. ..	..	..	..	..

PARIS.

Nov. 30.

Name of Company.	Country.	Product.	Capital Stock.	Par value.	Latest divs.	Prices. Op'ning	Prices. Closing
			Francs	Fr.	Fr.	Fr.	Fr.
Aciories de Creusot....	France.....	Steel mfrs..	27,000,000	2,000	75.00	1,975.00	1,981.00
" " Firminy....	"	" " ..	3,600,000	500	125.00	3,600.00	3,630.00
" " Fives-Lille..	"	" " ..	12,000,000	500	85.00	540 0	540.00
" " Huta-Bank..	Russia.....	Iron & steel	.....	500	.....	4,775.00	4,690 0
" " la Marine..	France.....	Steel mfrs..	20,000,000	500	*0.00	1,77 .00	1,769 00
Anzin.....	"	Coal.....	.....	.....	.....	220.00	7,859.00	7,2 0.00
Boleo	Lower Cal..	Copper.....	.....	500	1.07	2,869.0.	2,860.00
Briansk.....	Russia.....	Coal & Iron	.....	500	.....	1,4 5.75	1,286 75
Chaamp d'Or.....	S. Africa..	Gold.....	3,375,000	25	3.75	41.75	38.75
Courrieres.....	France.....	Coal.....	600,000	500	7. .00	3,0 0.00	3,0 0.00
Dombrowa	Russia	Coal.....	.....	500	12.50	1,1 0 00	1,1 0 00
Donets.....	"	Steel.....	.....	.....	.....	1,20 .00	1,202.50
Dynamite Centrale.....	France.....	Explosives..	.....	500	12.40	475.00	477.00
Escombrera-Bleyberg...	Spain.....	Lead.....	.....	500	85.00	1, 3 .00	1,335 00
Fraser River.....	Brit. Col'mb	Gold.....	250,000	25	7.00	7.00	7.00
Huanchaca	Bolivia..	Silver..	40,000,000	125	5.00	54.00	54 00
Laurium.....	Greece.....	Zinc & lead.	16,800,000	500	30.00	620.00	635.00
Malfidano.....	Italy.....	Zinc.....	12,500,000	500	50.00	1,355.00	1,325.00
Metaux, Cie. Fran. de...	France.....	Metal d'lers.	25,000,000	500	30.00	525.00	520.00
Mokta-el-Hadid.....	Algeria.....	Iron.....	18,312,500	500	40.00	1 23 00	1,220.00
Naphte Baku.....	Russia.....	Petroleums..	.....	.....	.....	8 6 00	821.00
Napthe, Le.....	"	"	.....	.....	.....	1,3 0.00	1,300 00
Napthe Nobel	"	"	.....	.....	.....	681.50	706.50
" " parts.....	"	"	.....	.....	.....	13,662.50	14,150.00
Nickel.....	N.Caled'nia	Nickel	10,000,000	250	10.00	367.00	367.00
Penarroya.....	Spain.....	Coal, etc....	.....	500	65.00	2,8 0.00	3,140.00
Rebecca.....	Colo'do, U.S.	Gold.....	5,000,000	25	.....	4.5.	5.00
Salines de l'Est.....	France.....	Salt	.....	500	11.50	300.00	235 00
Salines du Midi.....	France.....	" etc.....	.....	500	25.00	960.00	1,015 00
Vielle Montagne	Belgium	Zinc	9,000,000	80	3. 00	78 .00	771 00

LONDON.

Dec. 15.

Name of Company.	Country.	Authorised capital.	Par value.	Last dividend. Amt.	Last dividend. Date.	Quotations. Buyers	Quotations. Sellers
				£ s. d.	s.d.	£ s. d.	£ s. d.
Alaska Goldfields.....	Alaska.....	£300,000	£ 1	0 0	2 1 Mar., 1899	15 0	1 0 0
...aska-Mexican, g ...	"	2 0,000	1	0 0	0 4.5 Nov , 1899	17 6	1 2 6
Alaska-Treadwell, g.....	"	1,000,000	5	0 0	1 6 Nov ., "	5 0 0	5 5 0
Anaconda, c., s.....	Montana.....	4,0 0,000	5	0 0	8 2 Nov., 1899	8 0 0	8 5 0
Chiapas, g., c.....	Mexico.....	252,500	1	0 0	.....	5 0	7 0
Con. Gold Fields	"	300,000	1	0 0	.....	15 0	1 0 0
De Lamar, g., s.....	Idaho.....	400,000	1	0 0	6 May, 1899	2 6	5 0
Elkhorn Priority (New), s	Colorado.....	87,500	1	0 0	2 0 June, 1898	1 8	3 9
Golden Gate, g.....	California.....	80,000	1	0 0	.....	1 0	2 0
Grand Central, g., s.....	Mexico.....	300,000	1	0 0	2 0 Dec., 1899	1 9	1 6 3
Hall Mines, c., s.....	British Col....	250,000	1	0 0	1 0 Mar., 1899	5 0	5 2 6
Le Roi, g.....	" ..	1,000,000	5	0 0	5 0 Nov., 1899	5 2 6	5 7 6
*Lillie, g	Colorado...	250,000	1	0 0	2½ Jan., 190	15	1 0 0
Montana, g., s.....	Montana.....	660,000	1	0 0	6 Apr., 1899	4 6	5 6
Mountain Copper.	California.....	1,250,000	5	0 0	9 0 Sept., 1899	6 12 6	6 17 6
Newfoundland, c.....	Newfoundland.	250,000	1	0 0	....	7 6	12 6
Palmarejo & Mexican, g..s	Mexico..... ..	80,0 0	1	0 0	.....	1 6	1 9
Stratton's Independence..	Colorado....	1,100,000	1	0 0	2 0 Dec., 1899	2 11 3	2 18 9
Copiapo, c	Chile.....	200,000	2	0 0	3 0 Dec., 1899	3 15 0	4 2 0
Frontino & Bolivia, g	Colombia.....	140,000	1	0 0	1 6 Oct., 1899	1 17 6	2 0 0
*St. John del Rey, g	Brazil.....	400,000	1	0 0	1 0 Dec , 1899	1 7 6	1 10 0
UtahCon. (HighlandBoy)	Utah	300,000	1	0 0	rts. Mar., 1898	5 16 0	6 0 0
Velvet, g	BritishCol'mbia	100,000	1	0 0	....	1 2 6	1 7 6
Ymir, g.....	"	200,000	1	0 0	1 0 Nov., 1899	1 3 9	1 6 3
British Am. Corp.	"	1,500,000	1	0 0	rts. Dec., 1898	17 0	18 0
Linares, l	Spain	45,000	3	0 0	12 0 Oct., 1899	8 10 0	9 0 0
Mason & Barry, c., sul....	Portugal.....	420,000	2	0 0	5 0 May, 1899	4 0 0	4 5 0
Rio Tinto, c	Spain..... ..	1,625,000	5	0 0	1 15 Nov., 1899	44 17 6	45 2 6
" " pref.....	"	1,625,000	5	0 0	2 0 " "	5 17 6	6 2 6
Tharsis, c.	"	1,450,000	2	0 0	11 0 May, 1898	8 12 6	8 17 6
♦Assoc. Gold Mines.....	W. Australia..	800,000	1	0 0	x bo Dec., 1899	7 7 6	7 12 6
Broken Hill Prop., s.....	N.S. Wales.....	384,000		8 0	1 0 Oct., 1899	2 3 9	2 6 3
Great Boulder Prop..	W. Australia..	1,750,000		2 0	6 Dec., 1899	1 15 0	1 16 0
Hannan's Brownhill, g....	" ...	110,000	1	0 0	5 6 Jan., 190	10 12 6	10 17 6
Ivanhoe Gold Corp.....	" ...	1,000,000	5	0 0	5 0 Oct., 1899	15 2 6	15 7 6
Kalgurlie, g	" ...	120,000	1	0 0	rts. Feb., 1899	7 15 0	8 0 0
Lake View Consols, g.....	" ...	250,000	1	0 0	£21 Nov., 1899	5 0 0	15 15 0
Mt. Lyell M. & R., l., c	Tasmania.....	975,000	3	0 0	4 0 Oct., 1899	9 7 6	9 12 6
*Mt. Morgan, g.	Queensland.....	1,000,000	1	0 0	7 Dec., 1899	5 0 0	5 2 6
*Waihi, g	New Zealand..	320,000	1	0 0	2 0 Dec., 1899	9 5 0	9 10 0
Champion Reef, g.....	Colar Fields....	220,000		10 0	5 0 Jan., 190	5 7 6	5 .0 0
Mysore Gold, g.....	" ...	250,000		10 0	4 6 Nov., 1899	9 3 9	9 8 3
Nundydroog, g.....	" ...	242,000	1	0 0	2 0 " 1899	3 2 6	3 5 0
*Joregum, g.....	" ...	145,000	1	0 0	1 6 Dec., 1899	3 8 9	3 11 3
" pref. g.....	" ...	120,000	1	0 0	1 6 " 1899	4 11 3	4 13 9
British S. Af., chartered.	So. Africa.....	5,000,000	1	0 0	rts May, 1899	3 10 0	3 12 6
Cape Copper, c.....	"	600,000	1	0 0	6 6 Jan., 19.0	5 16 3	5 18 9
" " pref.....	"	150,000	2	0 0	6 6 " 1900	5 0 0	5 15 0
City & Suburban (New), g	Transvaal.....	1,380,0.0	4	0 0	8 0 Aug , 1899	4 17 6	5 0 0
Con Deep Level, g.....	"	300,000	1	0 0	x all June, 1898	1 0 0	1 1 0
Crown Reef, g.....	"	120,000	1	0 0	18 0 Nov., 1899	13 15 0	14 5 0
De Beers Con., d	Cape Colony...	3,850,000	5	0 0	£1 June, 1899	26 17 6	27 2 6
Ferreira, g	Transvaal	90,000	1	0 0	90 0 Aug., 1899	9 0 0	9 10 0
Geldenhuis Deep, g..... ..	"	250,000	1	0 0	8 0 Aug., 1899	8 0 0	8 15 0
Geldenhuis Est., g..... ..	"	200,000	1	0 0	10 0 Aug., 1899	5 12 6	5 17 6
Henry Nourse, g.....	"	125,000	1	0 0	10 0 Aug., 1899	7 17 6	8 2 6
Jagersfontein, d.....	Orange Fr. St..	1,000,000	5	0 0	9 0 June, 1899	13 10 0	14 0 0
Johannesburg Con. Invst.	So. Africa	2,750,000	1	0 0	2 0 Nov., 1899	1 12 6	1 15 0
Jubilee, g.....	Transvaal	50,000	1	0 0	5 0 Aug, 1899	5 5 0	5 15 0
Langlaagte Estate, g.....	"	300,000	1	0 0	3 0 Sept , 1899	3 0 0	3 2 6
May Con., g	"	275,000	1	0 0	6 0 Aug., 1899	4 2 6	4 5 0
Meyer & Charlton, g.....	"	85,000	1	0 0	8 0 July, 1899	4 7 6	4 12 6
Namaqua, c.	Cape Colony....	200,000	2	0 0	4 0 Dec., 1899	4 12 6	4 17 6
Primrose (New), g.....	Transvaal	300,000	1	0 0	6 0 Aug., 1899	3 15 0	3 17 6
Rand Mines, g.....	So. Africa.....	490,000	1	0 0	5 0 Aug., 1899	32 10 0	33 10 0
Robinson, g	Transvaal	2,750,000	5	0 0	8 0 Aug., 1899	3 5 0	3 10 0
Sheba, g.....	"	1,100,000	1	0 0	0 6 July, 1898	1 8 9	1 1 3
Sim. & Jack Prop., g.....	"	5,000,000	5	0 0	4 0 July, 1899	5 12 6	5 17 6
Wolhuter, g.....	"	880,000	4	0 0	2 0 Feb., 1899	3 17 6	4 2 6

*Ex-dividend. †Ex-bonus.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Val	Dividends. Paid, 1899.	Dividends. Total to Date.	Dividends. Date and Amount of Last.
1	Æna Cons., q.	Cal..	$500,000	100,000	$5	$45,000	$195,000	Oct.. 1899 .10
2	Alaska-Mexican, g.	Alask	1,000,000	200,000	5	72,000	429,081	Oct.. 1899 .10
3	Alaska-Treadwell, g.	Alask	5,000,000	200,000	25	300,000	4,220,000	Oct.. 1899 .37½
4	Alice, g. s.	Mont.	10,000,000	400,000	25	.....	1,075,000	April. 1898 .05
5	Amalgamated, c.	Mont.	75,000,000	750,000	100	1,500,000	1,500,000	Oct.. 1899 2.00
6	American Gold, g. s. c. l.	Colo..	3,000,000	300,000	10	48,000	434,000	June. 1899 .99
7	Amer. Sm. & Ref., pref.	U. S..	32,500,000	32,500	100	568,750	568,750	Oct.. 1899 1.75
8	Am. Zinc, Lead & Sm.	Mo...	500,000	200,000	25	40,000	40,000	Oct.. 1899 .10
9	Anaconda Copper	Mont.	30,000,000	1,200,000	25	3,900,000	12,150,000	Nov.. 1899 2.00
10	Anchoria-Leland, g.	Colo..	600,000	600,000	1	72,000	234,000	Oct.. 1899 .03
11	Anglo-Mexican, g.	Mex..	2,001,625	400,230	5	.....	1,728,993	Dec.. 1898 .24
12	Apollo Con., g.	Cal...	1,000,000	100,000	10	40,000	140,000	Jan.. 1899 .40
13	Appie Ellen, g.	Colo.	600,000	600,000	1	.....	25,000	Aug.. 1898 .01
14	April Fool	Nev..	500,000	500,030	1	16,000	16,000	Oct.. 1899 .01
15	Argonaut	Cal...	2,000,000	200,000	10	220,000	400,000	Nov.. 1899 .10
16	Associated, g.	Colo..	1,250,000	1,250,000	1	12,500	84,000	Feb.. 1899 .01
17	Atlantic, c.	Mich.	1,000,000	40,000	25	.....	780,000	Feb.. 1898 1.00
18	Aurora, l.	Mich.	2,500,000	100,000	25	50,000	890,000	June. 1899 .50
19	Bald Butte.	Mont.	250,000	250,000	1	142,500	762,141	Dec.. 1899 .06
20	Big Six, g. s.	Colo..	500,000	500,000	1	.....	15,000	May.. 1898 .00½
21	Bonanza.	Wash	1,000,000	1,000,000	1	7,500	7,500	Nov.. 1899 .00¼
22	Bonanza Dev.	N. M.	3,000,000	300,000	10	1,050,000	1,050,000	June. 1899 3.50
23	Boston-Aurora, pref.	Mo...	800,000	32,000	25	26,640	26,640	Nov.. 1899 .17
24	Boston & California.	Cal..	600,000	600,000	1	72,000	72,000	June. 1899 .06
25	Boston & Colo. Smelting	Colo..	750,000	15,000	50	45,000	270,000	Oct.. 1899 .75
26	Boston-Little Circle, z.	Mo-K.	1,000,000	100,000	10	80,000	80,000	Dec.. 1899 .15
27	Boston & Mont. Con.	Mont.	3,750,000	150,000	25	5,375,000	14,500,000	Nov.. 1899 15.00
28	Boston, q.	Cal...	1,000,000	100,000	10	10,000	10,000	Oct.. 1899 .10
29	Breece, i.	Colo..	5,000,000	200,000	25	40,000	70,000	Dec.. 1899 .05
30	Bullion-Beck & Champ.	Utah.	1,000,000	100,000	10	120,000	2,438,400	Dec.. 1899 .10
31	Bunker Hill & Sullivan.	Idaho	3,000,000	300,000	10	168,000	768,000	Dec.. 1899 .07
32	Calumet & Hecla, c.	Mich.	2,500,000	100,000	25	8,000,000	64,850,000	Sept.. 1899 20.00
33	Cariboo-McKinney, g.	B.Col	800,000	800,000	1	72,000	311,965	June. 1899 .01½
34	Centen l-Eureka, g.s.l.c.	Utah.	5,000,000	200,000	25	120,000	2,150,000	Aug.. 1899 .50
35	Central Lead, l.	Mo...	1,000,000	10,000	100	60,000	142,000	Dec.. 1899 .50
36	Champion, g. s.	Colo..	340,000	34,000	10	25,500	321,700	Nov.. 1899 .25
37	Charleston, p. r.	S. C..	1,000,000	10,000	100	20,000	200,000	June. 1899 2.00
38	Colorado Smelting.	Colo..	1,000,000	100,000	10	100,000	1,945,000	Jan.. 1899 1.00
39	Commodore.	Co o..	1,200,000	1,200,000	1	48,000	432,000	Jan.. 1899 .04
40	Commonwealth, z., pref.	Mo ..	500,000	100,000	5	20,000	20,000	Dec.. 1893 .01
41	Consolidation Coal	Md...	10,250,000	102,500	100	205,000	5,716,650	Feb.. 1899 2.00
42	Con. Tiger & Poorman.	Idaho	1,000,000	1,000,000	1	.....	20,000	Dec.. 1898 .02
43	Crœsus, g.	Cal...	1,000,000	200,000	5	.....	30,000	Dec.. 1898 .15
44	Crowned King, g. s. l.	Ariz.	6,000,000	600,000	10	.....	282,000	Dec.. 1898 .02
45	Daly	Utah.	3,000,000	150,000	20	.....	2,925,000	Mar.. 1897 .25
46	Daly West.	Utah.	3,000,000	150,000	20	60,000	60,000	Nov.. 1899 .20
47	Deadwood-Terra, g.	S. D..	5,000,000	200,000	25	.....	1,350,000	May.. 1898 .15
48	Deer Trail No. 2.	Wash	1,000,000	1,000,000	1	27,500	45,000	Nov.. 1899 .00¼
49	De Lamar, g. s.	Idaho	2,000,000	400,000	5	48,000	2,346,000	May.. 1899 .12
50	Della S., g.	Colo.	1,000,000	1,000,000	1	.....	60,000	Jan.. 1897 .01
51	Delta Lead & Zinc.	Mo...	100,000	100,000	1	4,100	4,100	Dec.. 1899 .00¼
52	Doe Run, l.	Mo...	500,000	5,000	100	30,000	90,000	Dec.. 1899 .50
53	Dutch, g.	Cal..	1,500,000	150,000	10	.....	39,000	Feb.. 1898 .04½
54	Eldorado, g.	Cal...	1,000,000	100,000	10	10,000	10,000	July.. 1899 .10
55	Elkton Cons., g.	Colo..	1,250,000	1,250,000	1	37,500	694,461	Sept.. 1899 .03
56	El Paso, g. s.	Colo..	650,000	650,000	1	.....	12,393	Jan.. 1898 .01
57	Empire State-Idaho.	Idaho	1,000,000	100,000	10	256,135	323,037	Dec.. 1899 .30
58	Enterprise, s. l.	Colo..	500,000	500,000	1	.....	900,000	Sept.. 1898 .05
59	Fanny Rawlings, g. s.	Colo..	1,000,000	1,000,000	1	20,000	20,000	Aug.. 1899 .01
60	Fern, g.	B.Col	200,000	200,000	1	.....	10,000	Jan.. 1898 .05
61	Ferris-Haggarty, c.g.s.	Wyo.	1,000,000	1,000,000	1	5,000	5,000	Mar.. 1899 .00½
62	Florence, s.	Mont.	2,500,000	500,000	5	.....	137,530	Aug.. 1897 .01
63	Garfield Con., g.	Colo..	1,200,000	1,200,000	1	12,000	12,000	May.. 1899 .01
64	Geyser-Marion, g.	Utah.	1,500,000	300,000	5	.....	96,000	Sept.. 1898 .02
65	Gold Coin of Victor, g.	Colo..	1,000,000	1,000,000	1	110,000	260,000	Nov.. 1899 .01
66	Gold & Globe, g.	Colo .	750,000	750,000	1	.....	51,625	July.. 1898 .00½
67	Gold King, g.	Colo..	1,000,000	1,000,000	1	90,000	90,000	Oct.. 1899 .03
68	Golden Cycle, g.	Colo..	1,000,000	200,000	5	105,000	258,500	Dec.. 1899 .05
69	Golden Eagle, g.	Colo..	500,000	500,000	1	10,000	20,000	Nov.. 1899 .01
70	Golden Fleece, g. s.	Colo..	600,000	600,000	1	.....	569,480	Feb.. 1897 .01
71	Golden Reward, g.	S. D..	1,000,000	100,000	10	.....	155,000	Feb.. 1898 .15
72	Golden Star, g.	B.Col	1,000,000	1,000,000	1	41,000	41,000	July.. 1899 .01
73	Grafton, g.	Colo..	1,000,000	1,000,000	1	10,000	10,000	Nov.. 1899 .01
74	Grand Central, g.	Utah.	250,000	250,000	1	347,500	666,250	Sept.. 1899 .24
75	Grass Valley Expl.	Cal...	100,000	30,000	2	30,000	30,000	Oct.. 1899 .25
76	Gwin, g.	Cal.	1,000,000	20,000	50	50,000	101,500	Dec.. 1899 .25
77	Hall Mines, Ltd.	B.Col	1,500,000	300,000	5	.....	160,000	May.. 1898 .25
78	Helena—Frisco, l. s.	Idaho	1,100,000	222,000	5	165,000	920,000	Nov.. 1899 .25
79	Holy Terror, g.	S. D..	500,000	500 600	1	45,000	162,000	Nov.. 1899 .01
80	Homestake, g.	S. D..	21,000,000	210,000	100	857,500	8,038,750	Nov.. 1899 .50
81	Horn-Silver, g. s. c. sp. l.	Utah.	10,000,000	400,000	25	20,000	5,259,000	Mar.. 1899 .05
82	Idaho, s. l.	B.Col	$500,000	500,000	$1	$28,000	$292,000	Jan.. 1899 .05
83	Iowa, g.	Colo..	1,000,000	1,000,000	1	.....	95,000	June. 1898 .00½
84	Iron Mountain, g. s. l. l.	Mont.	5,000,000	500,000	10	.....	507,500	April. 1898 .02
85	Isabella, g.	Colo..	2,250,000	2,250,000	1	202,500	472,500	Sept.. 1899 .01
86	Jack Pot, g.	Colo..	1,250,000	1,250,000	1	75,000	75,000	Sept.. 1899 .04
87	Jamison.	Cal ..	3,900,000	390,000	10	11,700	50,700	April. 1899 .10
88	Klondike Bonanza, Ltd.	Klond	750,000	52,750	5	12,000	12,000	Aug.. 1899 .24
89	Lake Superior Iron.	Mich.	2,100,000	84,000	25	84,000	736,000	Feb.. 1899 1.00
90	Last Chance, s. l.	B.Col	500,000	500,000	1	25,000	45,000	Apr.. 1899 .05
91	Last Dollar, g.	Colo..	1,500,000	1,500,000	1	20,000	20,000	Oct.. 1899 .02
92	Le Roi, g.	B.Col	5,000,000	200,000	5	240,000	1,305,000	Nov.. 1899 1.20
93	Lillie, g.	Colo..	1,250,000	250,000	5	135,000	301,610	Nov.. 1899 .05
94	Little Tiger, g.	Cal...	500,000	500,000	1	25,000	25,000	Nov.. 1899 .01½
95	Mammoth, g. s. c.	Utah.	10,000,000	400,000	25	260,000	1,610,000	Nov.. 1899 .10
96	Marion Con.	Colo..	5,000,000	500,000	10	5,000	300,000	May.. 1899 .01
97	Mary McKinney, g.	Colo..	1,000,000	1,000,000	1	30,000	30,000	Oct.. 1899 .03
98	Matoa, g.	Colo..	1,000,000	1,000,000	1	.....	25,000	Dec.. 1898 .02½
99	Mead, g.	Cal...	200,000	200,000	1	40,000	120,000	June. 1899 .20
100	Mercur, g.	Utah.	5,000,000	200,000	25	100,000	1,341,000	Oct.. 1899 .25
101	Minnesota Iron.	Minn.	16,500,000	165,000	100	.....	4,735,000	Oct.. 1898 1.50
102	Missouri Zinc Fields, pf.	Mo...	400,000	16,000	25	18,648	18,648	Nov.. 1899 .17
103	Modoc, g.	Colo..	500,000	500,000	1	30,000	130,000	Nov.. 1899 .01
104	Montana, Ltd., g. s.	Mont.	3,300,000	657,128	5	98,855	453,700	April. 1899 .12
105	Montana Ore Purchas'g.	Mont.	2,500,000	80,000	25	560,000	1,360,000	Oct.. 1899 1.00
106	Monument, g.	Colo..	300,000	300,000	1	.....	12,624	Dec.. 1898 .01
107	Moon-Anchor Con., g.	Colo..	1,750,000	600,000	1	45,000	306,000	Nov.. 1899 .07½
108	Morning Star, g.	Cal...	240,000	2,400	100	63,200	751,900	Oct.. 1899 3.00
109	Mt. Rosa, g.	Colo..	1,000,000	1,000,000	1	.....	60,000	Jan.. 1898 .02
110	Mt. Shasta.	Cal...	100,000	20,000	5	6,000	6,000	May.. 1899 .30
111	Moulton.	Mont.	2,000,000	400,000	5	40,000	500,000	Oct.. 1899 .05
112	Mountain Copper.	Cal ..	6,250,000	250,000	25	1,080,000	1,173,750	Oct.. 1899 2.16
113	Napa Cons., q.	Cal ..	700,000	100,000	7	90,000	1,040,900	Oct.. 1899 .30
114	New Central Coal.	Md...	1,00,000	50,000	2)	20,000	470,000	April. 1899 .40
115	New Idria, q.	Cal...	500,000	100,000	5	90,000	170,000	Oct.. 1899 .30
116	New York Zinc.	Mo...	700,000	28,000	25	21,000	21,000	Dec.. 1899 .25
117	N.Y.& Hon Rosario, s.g.	C. A..	1,500,000	150,000	10	150,000	1,130,000	Nov.. 1899 .10
118	North Star Mi es of N.J.	Cal ..	5,000,000	250,000	10	50,000	50,000	Nov.. 1899 .20
119	Nugget.	Colo..	1,000,000	1,000,000	1	.....	20,000	Aug.. 1898 .00¼
120	Okanogan, g.	Wash	62,500	1,250,000	05	3,125	3,125	Oct.. 1899 .00¼
121	Ontario, s. l.	Utah.	1,500,000	150,000	100	.....	13,557,500	Nov.. 1897 .75
122	Orphan Bell, g.	Colo..	1,000,000	1,000,000	1	.....	115,000	Mar.. 1898 .01
123	Original Empire, g.	Cal...	5,000,000	50,000	100	100,000	500,000	May.. 1899 1.00
124	Osceola, c.	Mich.	2,500,000	93,000	25	558,000	3,080,500	Dec.. 1899 3.00
125	Parrot, c.	Mont.	2,300,000	230,000	10	897,000	3,035,898	Oct.. 1899 1.50
126	Pennsylvania Coal.	Pa....	5,000,000	100,000	50	800,000	4,050,000	May.. 1899 8.00
127	Pennsylvania Cons.	Cal...	5,150,000	51,500	100	68,250	136,475	Dec.. 1899 .20
128	Petro, g.	Utah.	1,000,000	200,000	5	15,000	32,000	Oct.. 1899 .02½
129	Pioneer, g.	Cal...	1,000,000	100,000	10	12,500	62,500	Mar.. 1899 .12½
130	Portland, g.	Colo..	3,000,000	3,000,000	1	600,000	2,437,080	Nov.. 1899 .02
131	Queen Bess Propr., s. l.	B.Col	500,000	100,000	5	25,000	25,000	July.. 1899 .12½
132	Quicksilver, pref.	Cal...	4,300,000	43,000	100	21,500	1,845,411	May.. 1899 .50
133	Quincy, c.	Mich.	2,500,000	100,000	25	950,000	11,070,000	Aug.. 1899 6.00
134	Rambler—Cariboo, s. l.	B.Col	1,000,000	1,000,000	1	20,000	60,000	Dec.. 1899 .01
135	Raven, g.	Colo..	1,500,000	1,500,000	1	30,000	49,500	Nov.. 1899 .01
136	Reco, s. l.	B.Col	1,000,000	1,000,000	1	.....	297,500	Jan.. 1898 .10
137	Republic Cons., g.	Wash	3,500,000	3,150,000	1	157,500	277,500	Sept.. 1899 .01
138	Royal Con.	B.Col	2,500,000	2,500,000	1	50,000	1,050,000	June. 1899 .01
139	Sacramento, g.	Utah.	5,000,000	1,000,000	5	50,000	138,000	Oct.. 1899 .00½
140	St. Joseph, l.	Mo...	3,000,000	300,000	10	112,500	2,897,000	Sept.. 1899 .50
141	Seventy-Six, g. s.	Colo..	1,000,000	200,000	5	.....	3,950	Mar.. 1898 .02
142	Santa Rosalia, g.s.	Cal...	100,000	100,000	1	5,000	130,000	Oct.. 1899 .05
143	Silver King, g. s. l.	Utah.	3,000,000	150,000	20	375,000	2,400,000	Dec.. 1899 .34
144	Small Hopes, s.	Colo..	5,000,000	250,000	20	25,000	3,325,000	Feb.. 1899 .10
145	Smuggler, s. l. z.	Colo..	1,000,000	1,000,000	1	125,000	1,230,000	Dec.. 1899 .01
146	South Swansea, s. l.	Utah.	150,000	150,000	1	52,500	165,000	Dec.. 1899 .05
147	Squaw Mountain, g.	Colo..	2,000,000	2,000,000	1	10,000	10,000	Nov.. 1899 .00½
148	Standard Cons., g. s.	Cal...	2,000,000	200,000	10	60,000	3,893,226	Nov.. 1899 .10
149	Standard.	Idaho	500,000	500,000	1	30,000	1,745,000	April. 1899 .06
150	Stratton's Independ'ce.	Colo..	5,500,000	1,100,000	5	488,000	488,000	Sept.. 1899 .48
151	Swansea, s. l.	Utah.	500,000	100,000	5	60,000	251,000	Nov.. 1899 .05
152	Tamarack, c.	Mich.	1,500,000	60,000	25	600,000	6,270,000	Dec.. 1899 6.00
153	Tomboy, g.	Colo..	1,500,000	300,000	5	152,000	812,000	Dec.. 1899 .24
154	United, z. l., pref.	Mo...	1,000,000	40,000	25	40,000	40,000	July.. 1899 .50
155	Utah.	Utah.	1,000,000	100,000	10	2,000	179,000	Jan.. 1899 .02
156	Victor, g.	Colo..	1,000,000	200,000	5	.....	1,155,000	Dec.. 1898 .50
157	Vindicator, Cons., g.	Colo..	1,500,000	1,015,000	1	177,625	304,500	Oct.. 1899 .05
158	War Eagle, Cons.	B.C..	2,000,000	1,750,000	1	315,000	492,750	Dec.. 1899 .01½
159	West. Mine Enterprise.	Mont.	500,000	120,000	1	.....	48,680	Jan.. 1898 .20
160	Wolverine, c.	Mich.	1,500,000	60,000	25	210,000	270,000	Oct.. 1899 1.50
161	Yellow Aster, g.	Cal...	1,000,000	100,000	10	115,000	283,780	Dec.. 1899 .10

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Val	Assessments. Levied 1899.	Assessments. Total to Date.	Assessments. Date and Amount of Last.
1	Alaska.	Utah.	$1,000,000	1,000,000	$1	$50,000	$50,000	Sept.. 1899 .01½
2	Arnold, c.	Mich.	1,500,000	60,000	25	180,000	180,000	Jan.. 1899 3.00
3	Best & Belcher, g. s.	6.	Nev..	302,400	100,800	3	40.320	2,631,403	Oct.. 1899 .20
4	Bingham Placer.	Utah.	275,000	275,000	1	27,500	27,500	Oct.. 1899 .10
5	Boston & Cp. Ck., g.	Co'o..	400,000	200,000	2	.....	20,000	Aug.. 1898 .10
6	California Borax.	Cal...	200,000	2,000	100	4,000	4,000	Oct.. 1899 2.00
7	Centennial, c.	Mich.	2,500,000	100,000	25	.....	460,000	Mar.. 1898 3.00
8	Central Eureka, g.	Cal...	4,000,000	400,000	10	34,000	135,942	Sept.. 1899 .03
9	Chollar, g. s.	Nev..	336,000	112,000	3	28,000	2,075,000	Aug.. 1899 .15
10	Con. Cal. & Va.	Nev..	540,000	216,000	2½	108,000	786,000	Oct.. 1899 .25
11	Cons. Imperial, g. s.	Nev..	500,000	500,000	1	10,000	2,256,000	Nov.. 1899 .01
12	Crown Point, g. s.	Nev..	300,000	100,000	3	20,000	2,990,000	Nov.. 1899 .10
13	Dalton, s. l.	Utah.	2,500,000	500,000	5	5,000	58,750	April. 1899 .01
14	Dexter.	Nev..	1,000,000	200,000	5	.....	38,000	Apr.. 1898 .15
15	Diamond Con.	Utah.	1,000,000	200,000	5	8,000	8,000	Mar.. 1899 .04
16	Eureka Con. Drift. g.	Cal...	500,000	500,000	1	12,500	183,000	Nov.. 1899 .00½
17	Geyser, s. l.	Colo..	5,000,000	500,000	10	150,000	1,225,000	July.. 1899 .10
18	Gold Coin.	Colo..	1,000,000	200,000	5	10,000	10,000	Mar.. 1899 .05
19	Gould & Curry.	Nev..	324,000	108,000	3	27,000	4,646,050	Oct.. 1899 .15
20	Granite Hill, g. s.	Cal...	500,000	100,000	5	3,000	124,000	June. 1899 .03
21	Great Western, q.	Cal...	5,000,000	50,000	100	20,000	75,520	May.. 1899 .15
22	Hale & Norcross, g.s.	Nev..	336,000	112,000	3	33,200	39,200	Nov.. 1899 .10
23	Head Center Con., s.g.	Ariz..	5,000,000	200,000	25	25,125	25,125	Mar.. 1899 .20
24	Horse Shoe Bar Cons.	Cal...	6,000,000	60,000	100	3,000	85,800	Jan.. 1899 .05
25	Little Pittsburg.	Utah.	2,000,000	400,000	5	3,000	21,000	June. 1899 .00¾
26	Lower Mammoth.	Utah.	150,000	150,000	1	7,500	22,500	June. 1899 .05
27	Lucky Bill.	Utah.	300,000	120,000	2½	2,500	58,800	Nov.. 1899 .02
28	Marguerite, g.	Cal...	500,000	50,000	10	15,000	85,000	Aug.. 1899 .10
29	Marina Marsicano, g.	Cal...	$1,000,000	100,000	$10	$19,000	$54,360	Oct.. 1899 .05
30	Martin White.	Nev..	1,000,000	100,000	10	150,000	150,000	Dec.. 1899 1.50
31	Mayday, g. s.	Cal ..	50 000	50,000	1	5,000	10,000	July.. 1899 .10
32	Mayflower, g.	Cal...	1,200,000	60,000	20	.....	6,000	Sept.. 1898 .05
33	Meteor, s. l.	Utah.	600,000	300,000	2	6,000	9,734	Sept.. 1899 .01
34	Mexican, g. s.	Nev..	302,400	100,800	3	25,200	2,283,920	Nov.. 1899 .15
35	Montreal.	Utah.	2,500,000	250,000	10	25,000	30,625	April. 1899 .05
36	Northern Light, g.	Utah.	2,000,000	400,000	5	.....	80,000	July.. 1898 .10
37	Ophir, g. s.	Nev..	302,400	100,800	3	50,400	4,652,968	Nov.. 1899 .20
38	Osceola, g.	Cal ..	10,000,000	100,000	100	1,000	11,810	Oct.. 1899 .01
39	Potosi, g. s.	Nev..	336,000	112,000	3	28,000	2,185,200	Sept.. 1899 .15
40	Powning.	Cal...	750,000	75,000	10	2,800	2,800	Aug.. 1899 .01
41	Rescue, g.	Nev..	100,000	10,000	10	500	5,500	Feb.. 1899 .05
42	Reward, g.	Cal...	64,000	64,000	1	1,400	65,280	Nov.. 1899 .02½
43	Revenue.	Utah.	150,000	150,000	1	4,500	4,500	Nov.. 1899 .02
44	Salmon River, c. s. g.	Nev..	57,000	57,000	1	1,425	11,970	Oct.. 1899 .02½
45	Savage, g. s.	Nev..	280,000	112,000	2½	22,400	7,309,800	Sept.. 1899 .10
46	Shower Con.	Utah.	2,000,000	400,000	5	8,000	8,000	Aug.. 1899 .02
47	Sierra-Nevada, g. s.	Nev..	300,000	100,000	3	50,000	6,756,910	Dec.. 1899 .15
48	Silver King, s.	Ariz.	10,000,000	100,000	100	50,000	490,000	Aug.. 1899 .25
49	Snow Flake.	Utah.	500,000	100,000	5	5,000	51,000	July.. 1899 .02
50	Sunbeam Cons.	Utah.	250,000	250,000	1	50,000	73,125	Oct.. 1899 .10
51	Tetro.	Utah.	300,000	300,000	1	15,000	33,000	Nov.. 1899 .01
52	Union Cons., g. s.	Nev..	250,000	100,000	2½	18,000	2,660,000	Sept.. 1899 .15
53	Utah Cons., s.	Nev..	100,000	100,000	1	15,000	485,000	Sept.. 1899 .05
54	Valeo.	Utah.	200,000	200,000	1	10,000	10,000	May.. 1899 .05
55	Watt Blue Gravel, g.	Cal...	1,100,000	100,000	10	3,000	58,000	May.. 1899 .03
56	Yellow Jacket, g. s.	Nev..	360,000	120,000	3	18,000	5,306,000	April. 1899 .15

G., Gold. S., Silver. L., Lead. C., Copper. Z., Zinc. This table is corrected up to Dec. 1. Correspondents are requested to forward changes or additions.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

	Cust.	Meas.	Price.
Abrasives—			
Carborundum, f.o.b. Niagara Falls grains	lb.		$0.10
Powd., F. FF. FFF.	"		.08
Minute No. 1	"		.15
No. 15	"		1.00
Corundum, N. C.	"		.07@.10
Chester	"		.04½@.05
Emery, Turkish flour	"		.03
Grains	"		.05
Naxos flour	"		.03
Grains	"		.05
Chester flour	"		.03
Grains	"		.05
Peekskill flour	"		.01¾
Grains	"		.02½
Crude, Kuluk, best	lg. ton		18.50
Levant, "	"		22.00
Naxos (Greek) best	"		26.00
Pumice Stone, Am. powd.	lb.		.01¾@.02
Italian, powdered	"		.01½
Lump, per quality	"		.04@.40
Rottenstone, ground	"		.02½@.03
Lump, per quality	"		.05@.14
Rouge	"		.17@.30
Acids—			
Acetic, 30% pure	100 lbs.		2.75@4.00
30% ch. pure	"		6.00@8.00
80% pure	"		7.50@9.50
Benzoic, English	oz.		.12@.12½
German	lb.		.46@.47
Boracic, pure cryst	"		.11
Powdered	"		.11½@.11¾
Carbolic, cryst. in drums	"		.21
Carbonic, liquid	"		.12½
Chromic, crude	"		.20
Chem pure	"		.50
Absol. ch. pure	"		1.75
Hydrochloric, ch. pure	"		.08
Hydrofluoric, 36%	"		.03@.04½
48%	"		.05@.06
Best	"		.25
Nitric, chem. pure	"		.10
Sulphuric, 98%	"		.02
Chem. pure	"		.07
Tartaric, cryst	"		.32
Powder	"		.32½
Alcohol—Grain	gal.		2.40@2.44
Refined wood, 95@97%	"		.90@.95
Purified	"		1.50
Alum—Lump	100 lbs.		1.75
Ground	"		1.85
Chrome, com'l	"		3.50
Aluminum—Nitrate	lb.		1.50
Oxide, com'l, common	"		.06½
Best	"		.20
Pure	"		.80
Hydrated	"		.05
Sulphate, pure	"		1.50
Com'l	"		.01¼@.01½
Ammonia—Aqua, 16°	"		.05
18°	"		.05½
20°	"		.06
25°	"		.08
Ammonium—Bromide, p'r	"		.52@.53
Carbonate lump	"		.08¼@.08¾
Powdered	"		.09¼@.09¾
Muriate, gran., white	"		.07
Gran. ch. p	"		.07½@.09
Lump	"		.09½
Gray	"		.06½@.06¾
Nitrate, white, pure (99%)	"		.10½
Phosphate, com'l	"		.12@.15
Chem. pure	"		.60
Antimony—Glass	"		.30@.40
Needle, lump	"		.05½@.06
Powdered, ordinary	"		.05¾
Best	"		.08½
Oxide, com'l white, 95%	"		.09¼
Com'l white, 99%	"		.12
Com'l gray	"		.07@.08
Sulphuret, com'l	"		.16
Arsenic—White	"		.04¾@.05
Red	"		.08@.08¼
Asphaltum—			
Ventura, Cal	sh. ton		32.00
Cuban, refined	lb.		.04½
Common	"		.02
Egyptian, refined	"		.06½
Trinidad, refined	"		.01½
San Valentino	lg. ton		15.00
Gilsonite, Utah, ordinary	lb.		.03¼
Select	"		.03¾
Barium—Carbonate, Lump, 80@90%	sh. ton		25.00@27.50
92@98%	"		26.00@29.00
Powdered, 80@90%	lb.		.01¾@.02
Chloride, com'l	"		.02@.02¼
Chem. pure cryst	"		.05
Nitrate, powdered	"		.05½
Oxide, com'l, hyd. cryst	"		.18@.22
Hydrated, pure cryst.	"		.25
Pure, powd	"		.27
Sulphate	"		.01
Barytes—Crude, No. 1	sh. ton		9.00@10.00
No. 2	"		8.00@8.25
No. 3	"		7.75@8.00
Prime White	"		18.00@20.00
Floated	"		19.00@20.00
Bauxite—Ga. mines: 1st grade	lg. ton.		5.00
Second grade	"		3.80
Ala, f.o.b., 1st grade	"		4.75
Second grade	"		3.50
Benzole—90%	gal.		1.00@1.10
Bismuth—Oxide, hydr	lb		2.25@2.56
Subnitrate cryst	oz.		.09@.10
Bitumen, "B"	lb.		.03½
"A"	"		.05
Bone Ash	"		03¾@.03½
Borax—Cryst. and pow'd	"		.07@.07¼
Calcined	"		.22
Bromine—Bulk	"		.45
Cadmium—Metallic	"		1.50@2.00
Sulphide	"		2.00@3.00
Sulphate	"		2.00@2.50
Acetate, pure white	100 lbs.		$1.00

	Cust.	Meas.	Price.
Calcium—			
Gray	100 lbs.		1.50@1.55
Brown	"		1.05@1.10
Carbide, in ton lots, f. o. b. Niagara Falls, N.Y.	sh. tons.		75.00
Coal tar pitch	gal.		.08
Carbonate, ppt	lb.		.05
Chloride, com'l	100 lbs.		.95
Best	"		1.90
Sulphite	lb.		.05
Cement—			
Portland, Am., 400 lbs.	bbl.		1.50@2.00
Foreign	"		1.75@2.50
"Rosendale," 300 lbs	"		.90
Sand cement, 400 lbs	"		1.55@1.95
Slag cement, imported	"		1.65
Ceresine—			
Orange and Yellow	lb.		.11
White	"		.12@.13½
Chalk—Lump, bulk	sh. ton		2.15@2.25
Precipitated	lb.		.04@.04½
French	100 lbs.		.30@.35
Chlorine—Liquid	lb.		.24
Water	"		.15
Chrome Ore— (50% chrome) ex ship	lg. ton		20.00@21.00
Sand	"		35.00
Clay, China—Am. com., ex-dock, N. Y.	lg ton		7.70
Am. best, ex-dock, N. Y.	"		8.70
English, common	"		11.00
Best grade	"		16.00
Fire, ground, f.o.b. Jersey City, N. J.	sh. ton		4.00@5.00
Slip Clay	"		6.00
Coal Tar Pitch	gal.		.08
Cobalt—Carbonate	lb.		1.50
Nitrate	"		1.30
Oxide—Black	"		2.00
Gray	"		2.50
Smalt, blue ordinary	"		.20
Best	"		.30
Chem. pure	"		5.00
Copperas	100 lbs.		.62½
Copper—Carbonate	lb.		.18@.20
Chloride	"		.25
Nitrate, crystals	"		.35
Oxide	"		.19@.20
Cream of Tarter—crys.	"		.23½
Granulated	"		.24
Powdered	"		.24
Cryolite	"		.06½
Explosives—			
Blasting powder, A	"		.10
Blasting powder, B	"		.05@.05½
"Rackarock," A	"		.25
"Rackarock," B	"		.18
Judson R.R. powder	"		.10
Dynamite, (40% nitro-glycerine)	"		.15
(50% nitro-glycerine)	"		.17
(60% nitro-glycerine)	"		.19
(75% nitro-glycerine)	"		.22
Glycerine for nitro (32 2-10° Be.)	"		.16½
Nitro-Benzole	"		.14
Feldspar—Ground	sh. ton		6.50@7.75
Flint—(See Silica).			
Fluorspar, f. o. b. mines—			
Am. lump, 1st grade	"		7.50
2d gr	"		6.50
Gravel	"		6.00
Crushed	"		5.75
Ground, ex. fine	"		19.00
2d gr	"		15.00
Foreign, lump	"		8.00@12.00
Ground	"		11.50@14.00
Fuller's Earth—Lump	100 lbs.		.75
Powdered	"		.85
Refined lump	"		1.25
Ganister Rock	lg. ton.		6.50
Graphite—(See Plumbago).			
Gypsum—Am. gr'd	sh. ton		8.00
Fertilizer	"		7.00
Rock	lg. ton		4.00
English and French	"		14.00@16.00
Infusorial Earth—Ground, American, best	"		20.00
French	"		37.50
German	"		40.00
Iodine—Crude	100 lbs.		2.45
Resublimed	"		2.85
Iron—Chromate	lb.		.03@.10
Muriate	"		.05
Nitrate, com'l	"		.01¼@.01¾
True	"		.04
Oxide, pure copperas col	"		.05@.10
Purple-brown	"		.02
Venetian red	"		.01@.01½
Scale	"		.01@.03
Kaolin—(See Clay, China).			
Kryolith—(See Cryolite.)			
Lead—Acetate, white	lb.		.06½@.07½
Com'l, broken	"		.06@.07
White, gran	"		.07½@.08
Nitrate, com'l	"		.07@.07¼
Chem. pure	"		.35
Lime—Bldg., ab. 250 lbs	bbl.		.90
Finishing	"		1.00
Magnesite—			
Crude, lump (95%) Greece	lg. ton		7.25
German (85%)	"		12.00
Calcined, 600° C. (Greece)	"		15.00
1,000° C. (Greece)	"		18.50
3,000° F. (Greece)	"		21.00
Domestic, soft	sh. ton		12.00@15.00
Bricks, all magnesite	M.		185 00
Magnesite and chrome	"		226.00
Magnesium—			
Metallic, ingots (Ger)	kg.		5.95@6.90
Powdered (Ger.)	"		6.19
Ribbon or wire (Ger.)	"		10.00
Carbonate, light, fine pd	lb.		.03¾@.04
Blocks	"		.06@.09
Chloride, com'l	"		.01¾
Fused	"		.20
Nitrate	"		.60

	Cust.	Meas.	Price.
Manganese—			
Crude, pow'd 70@75% binoxide	lb.		.01¼@.01½
75@85% binoxide	"		.01½@.02½
85@90% binoxide	"		.02½@.03¼
90@95% binoxide	"		.02¾@.05⅛
Carbonate	"		.16@.20
Chloride	"		.04
Ore, 50%	unit		.22@.22½
Marble—Flour	sh. ton		5.50@8.00
Mercury—			
Bichloride	lb.		74 @.76
Mica—N. Y. gr'nd, coarse	"		.03@.05
Fine	"		.06@.07
Sheets, 1½x3 in	"		.60
8x10 in	"		13.00
Mineral Wool—			
Slag, ordinary	100 lbs.		.90
Selected	"		1.40
Extra	"		3.00
Rock, ordinary	sh. ton		32.00
Selected	100 lbs.		2.50
Extra	"		5.00
Monazite—92%	sh. ton		140.00
Nickel—Oxide, bl'k No. 1	lb.		1.00
Black No. 2	"		.60
Green, No. 1	"		1.00
No. 2	"		.60
Oils—Black, reduced 29 gr.:			
25@30 cold test	gal		.11@.11½
15. cold test	"		.12@.12½
Zero	"		.13@.14
Summer	"		.10½@.11
Cylinder, dark steam ref	"		.10@.15
Dark filtered	"		.13@.18
Light filtered	"		.15@.17½
Extra cold test	"		.23@.27
Gasoline, 86° @ 90°	"		.16@.21
Neutral filtered, lemon, 33@34 gr	"		.15@.20½
White, 33@34 gr	"		.23@.25
Wool grade, 32 gr	"		.13@.16
Naphtha, crude 68@72°	"		10.65
"Stove"	"		.13
Linseed, domestic raw	"		.50
Boiled	"		.52
Calcutta, raw	"		.65
Graphite, lubricating, Am. dry	lb.		.10
In oil	"		.12
Axle grease	"		.08½@.10
Wood grease	"		.05@.06
Ozokerite—Foreign	"		.08
Paints and Colors—			
Benzine, Sumatra	"		.35@.40
Marbled	"		.27@.28
Chrome green, common	"		.05@.06
Extra	"		.12@.15
Chem. pure	"		.19@.25
Yellow, common	"		.10
Best	"		.25
Silica Graphite, thick	"		.12
Thinned	gal.		1.15
Lampblack—Com'l	lb.		.03@.05
Refined	"		.08@.10
Calcined	"		.12@.20
Fine spirit	"		.20@.35
Litharge, Am. powd	"		.06¼@.06¾
English flake	"		.08¼@.08¾
Metallic, brown	sh. ton		16.00@20.00
Red	"		16.00@20.00
Ocher, Am. common	"		9.25@10.00
Best	"		21.25@25.00
Dutch, washed	lb.		.04¾@.05
French, washed	"		.01¼@.02½
Orange mineral, Am	"		.07¾@.08
Foreign, as to make	"		.09¼@.12
Paris green, pure	"		.14@.15
Red lead, American	"		.06¼@.06¾
Foreign	"		.08¼@.08¾
Shellac, "D. C."	"		.26
Native	"		.16
Turpentine, spirits	gal.		51.@.51½
Ultramarine, best	lb.		.25
Vermilion, Amer. lead	"		.10
Quicksilver	"		.69
Chinese	"		.80
English, imported	"		.71@.72
White lead, Am., dry	"		.05¼@.05¾
In oil	"		.06@.06¼
English, in oil	"		.07½@.08¼
Whiting, common	100 lbs.		.42½
Gilders	"		.47
Zinc white, Am. ex. dry	lb.		.04¾@.05¼
American, red seal	"		.07@.07¾
Green seal	"		.07¾@.08¼
Foreign, red seal, dry	"		.07¾@.08¾
Green seal, dry	"		.08¾@.09¾
Foreign, in oil	"		.10¼@.11¾
Plumbago—			
Am. lump, f. o. b. Providence, R. I.	sh. ton		8.00
Am. pulv., f. o. b. Providence, R. I.	"		30.00
German, lump	lb.		.01½
Pulverized	"		.02
Ceylon, pulv. common	"		.04¼@.05
Best	"		.07@.10
Italian, pulv	"		.01½
Potash—Caustic, ord	"		.05¾
Elect. (90%)	"		.06¾
Potassium—			
Metallic, in balls (Ger)	kg.		17.85
Bicarbonate cryst	lb.		.08½
Powdered or gran	"		.12
Bichromate	"		.09¼@.09½
Bromide	"		.46
Carbonate	"		.02¾@.03½
Chromate	"		.35
Cyanide (98@99%)	"		.28@.29
Ferro-cyanide	"		.19@.20
Iodide	"		2.15
Permanganate, pure cr.	"		.14@.15
Prussiate, yellow	"		.19½@.20
Red	"		.37@.38
Silicate	"		.06
Sulphide, com'l	"		.10

	Cust.	Meas.	Price.
Quartz—(See Silica).			
Rosin—Common (280 lbs.)	bbl.		$1.45
Best	"		4.10
Salt—N.Y. com. fine abt. 380 lbs	bbl.		.70
N. Y. agricultural	sh. ton		1.50
N. Y. coarse	"		2.30
N. Y. dairy and table	"		2.90
Saltpeter—Crude	100 lbs.		3.80@3.85
Refined	"		4.25@5.25
Samarskite	lb.		1.00
Silica—Best foreign	lg. ton		10.00@11.00
Ground quartz, ord	sh. ton		6.00@8.00
Best	"		12.00
Lump quartz	"		2.50@4.00
Glass sand	"		2.75
Fire bricks (Blue Welch)	M.		35.00
Silver—Chloride	oz.		.65
Nitrate	"		.40@.41
Oxide	"		.85@1.10
Sodium—Metallic	lb.		.07¾
Acetate, com'l	"		.03¾@.04
Bichromate	"		.07
Bromide	"		.49@.50
Chlorate, com'l	"		.08@.09¼
Hyposulphite	100 lbs.		1.60@1.70
Nitrite	lb.		.07½@.07¾
Peroxide	"		.45
Phosphate	"		.02¾@.03
Triphosphate	"		.04
Silicate, conc	"		.06
coml	"		.01@.01½
Sulphate, gran., puri'd	"		.03
Sulphide	100 lbs.		1.75
Sulphite	lb.		.02½
Tungstate, com'l	"		.35
Pure	"		.50
Strontium—Nitrate	"		.07½
Sulphur—Roll	100 lbs.		1.70
Flour	"		1.80@1.85
Flowers, sublimed	"		2.00
Talc—N. C. No. 1	sh. ton		15.00@15.50
No. 2	"		10.00@12.00
N. Y., Fibrous	"		8.00@9.00
French	100 lbs.		1.25@1.50
Italian	"		1.50@2.00
Tin—Chloride	lb.		.13@.15
Crystals	"		.24@.26
Muriate, com'l	"		.09
Oxide, white, ch. pure	"		.52
Uranium—Oxide	"		1.80@3.00
Zinc—Metallic, ch. pure	"		@.10
Carbonate	"		.15
Chloride	"		.05@.06
Dust	"		.07@.07¼
Sulphate	"		.02½

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

	Cust.	Meas.	Price.
Barium—Amalgam	grm.		$1.19
Electrol	"		5 71
Beryllium—Powder	"		5.95
Crystals	"		9.04
Nitrate (N Y.)	oz.		2.50
Boron—Amorphous, pure	grm.		.19
Crystals, pure	"		1.43
Nitrate (N. Y.)	lb.		1.50
Calcium—Electrol	"		4.28
Cerium—Fused	grm.		2.02
Nitrate (N. Y.)	lb.		21.00
Chromium—Fused	kg.		5.95
Pure powder 95%	"		1.79
Chem. pure cryst	grm.		.21
Cobalt—(98@99%)	kg.		5.35@5.71
Pure	"		30.94
Didymium—Powder	grm.		3.81
Nitrate (N. Y.)	oz.		4.00
Erbium	grm.		3.09
Nitrate (N. Y.)	oz.		3.00
Gallium	grain		9 52
Germanium—Powder	grm.		33.32
Fused	"		35.70
Glucinum—Powder	"		5.95
Crystals	"		9.04
Nitrate (N. Y.)	oz.		2.50
Indium	grm.		4.05
Iridium—	"		2.38
Lanthanum—Powder	"		4.28
Electrol, in balls	"		9.04
Nitrate (N. Y.)	oz.		3.50
Lithium	grm.		2.38
Nitrate (N. Y.)	oz.		.60
Molybdenum—Powder	kg.		2,62
Fused, electrol 95%	100 grms.		15.47
Niobium	grm.		3.81
Osmium	"		.95
Palladium	"		.95
Rhodium	"		2.87
Rubidium—Pure	"		4.76
Ruthenium—Pure powd	"		2.38
Selenium—Com'l powder	kg		30.94
Sublimed powder	"		40.46
Sticks	"		33.32
Silicium—Amorphous	100 grms.		2.87
Crystals, pure	"		5.95
Strontium—Electrol	grm.		6.19
Tantalium—Pure	"		3.57
Tellurium—Ch. p. sticks	100 grms.		11.90
Powder	"		9.52
Thallium	kg.		23.80
Thorium—Metallic	grm.		7.85
Nitrate 49@50% (N. Y.)	lb.		5.00@5.50
Titanium	grm.		.71
Uranium	"		.48
Nitrate (N. Y.)	oz.		.25
Vanadium—Fused	grm.		1.19
Wolfram—Fused	100 grms.		22.80
Powder, 95@98%	kg.		1.90
Chem. pure	"		6.42
Yttrium	grm.		3.33
Nitrate (N. Y.)	oz.		4.00
Zirconium—Com'l	kg.		119.00
Pure	grm.		.71
Nitrate (N. Y.)	oz.		1.00

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to Dec. 29th. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Review of Chemicals and Minerals.

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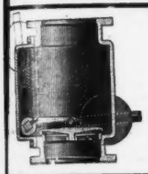

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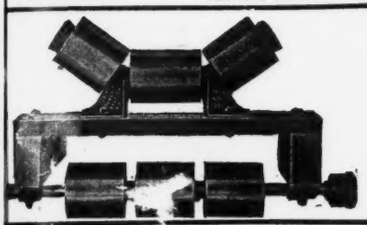

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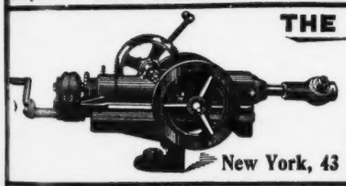

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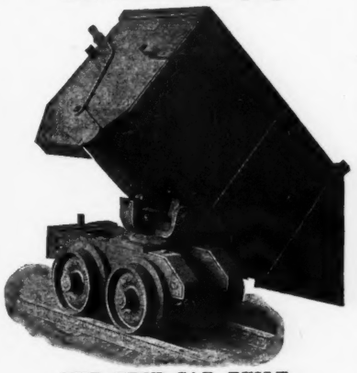

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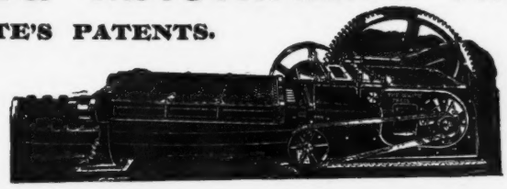

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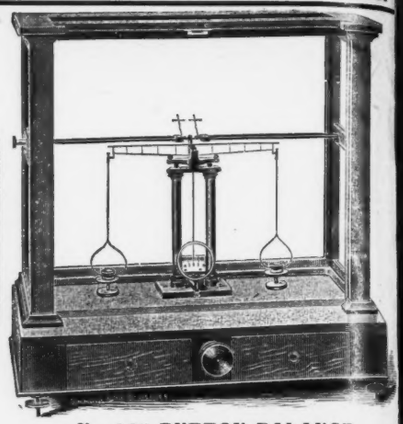

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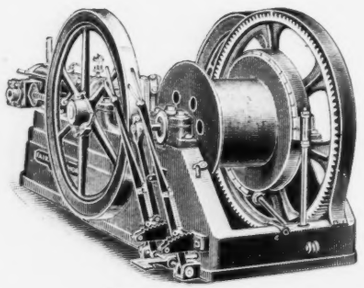

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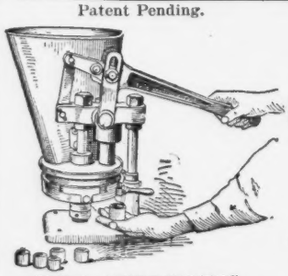

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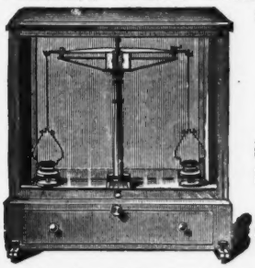

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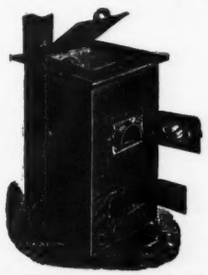

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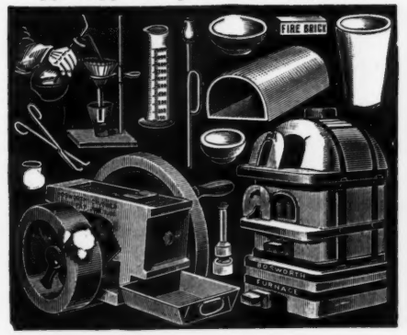

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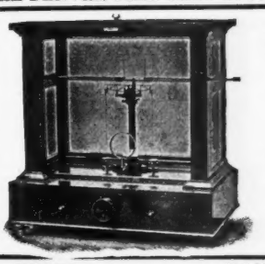

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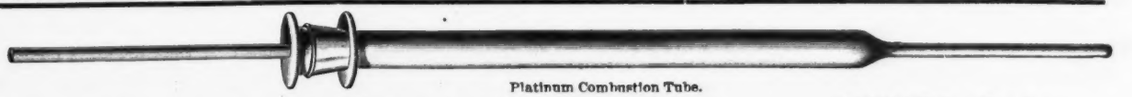

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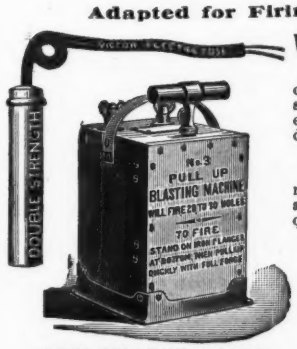

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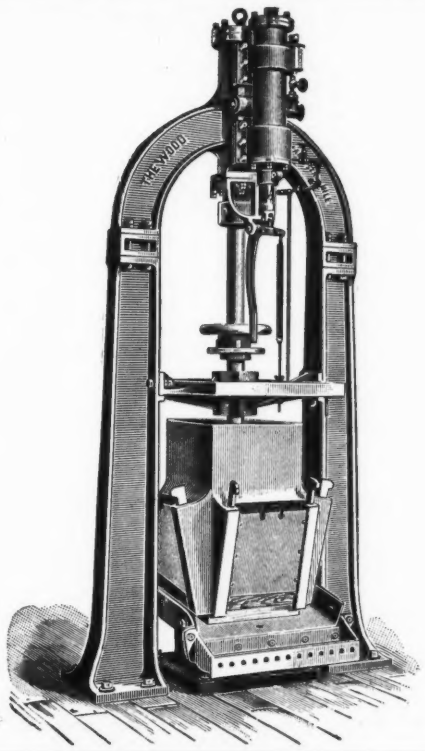

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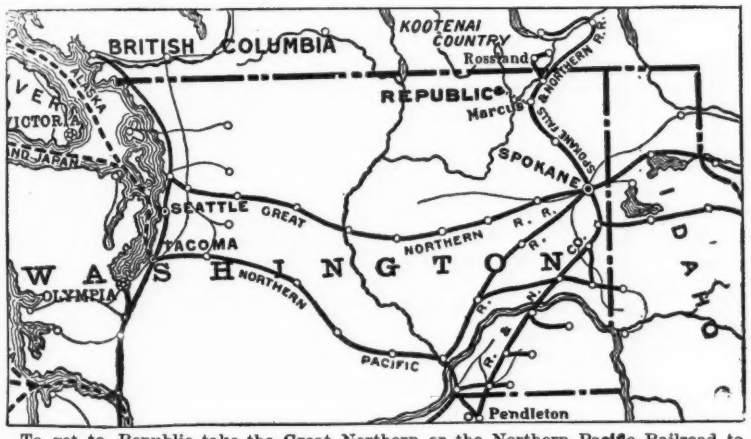

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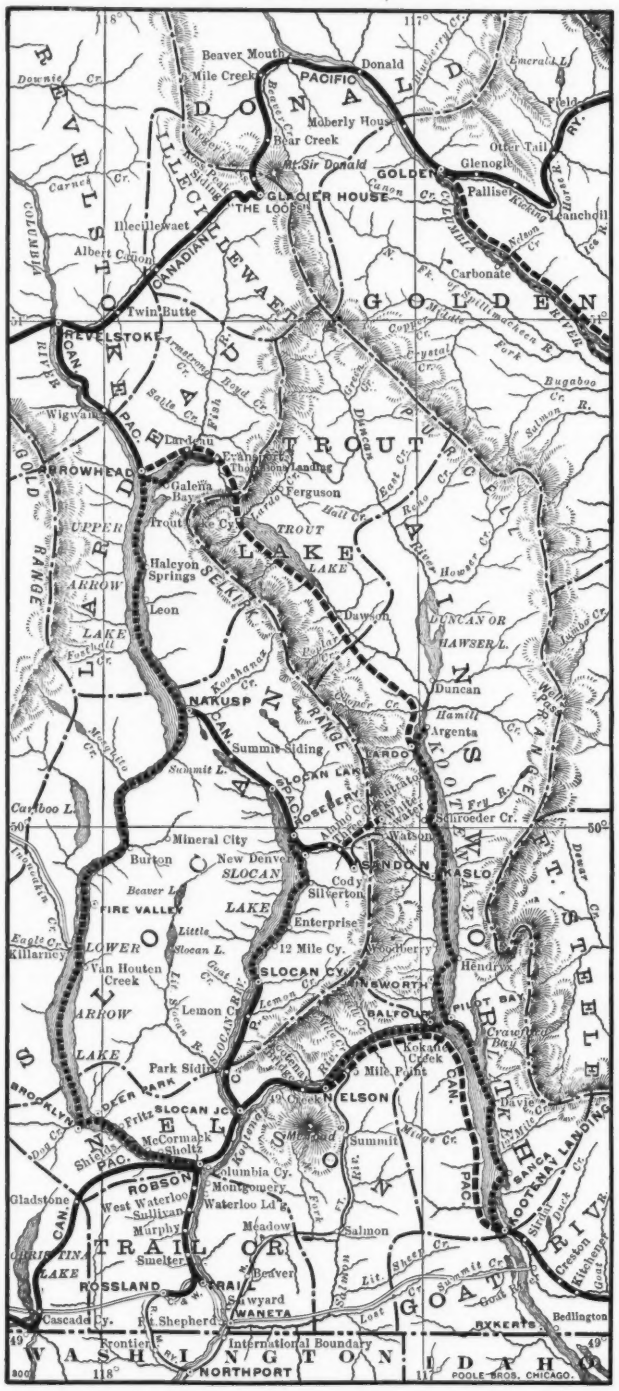

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Its Statistics, Technology and Trade in the United States and other Countries to the End of 1898

EDITED BY

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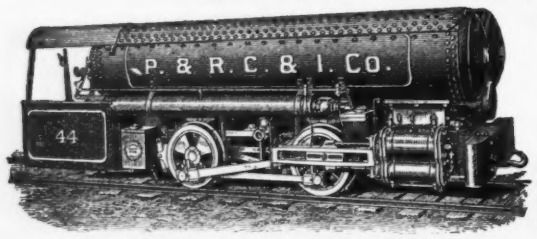

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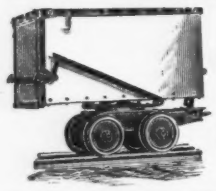

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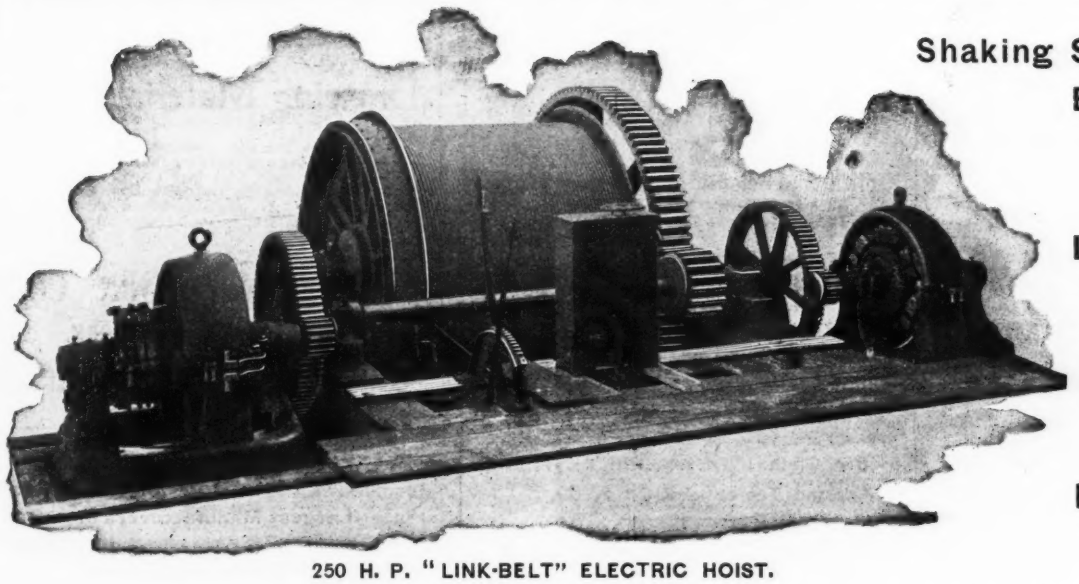

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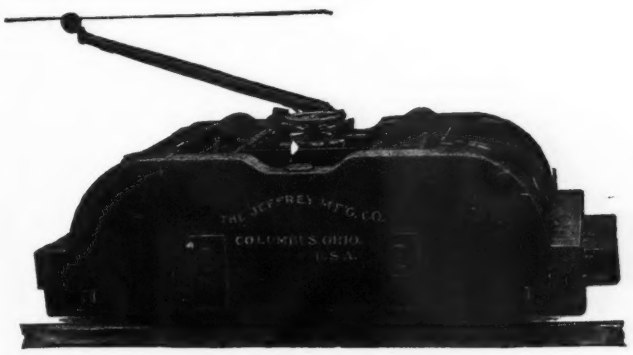

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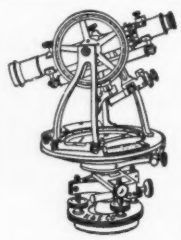

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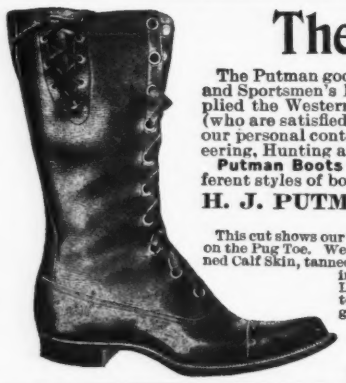

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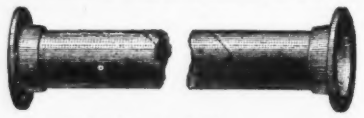

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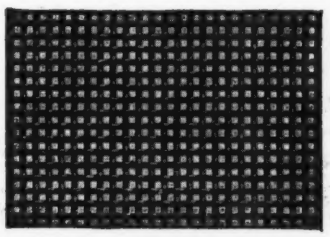

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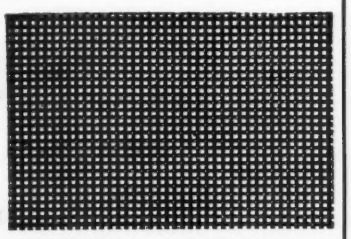

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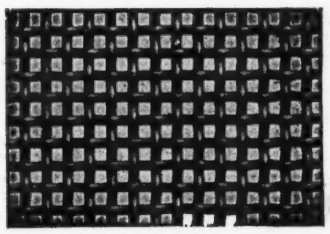

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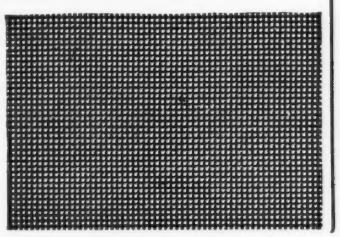

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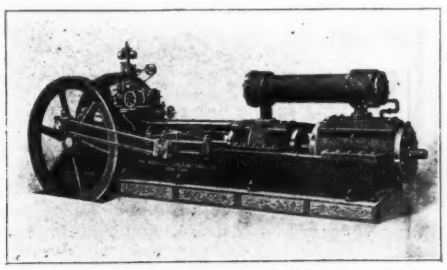

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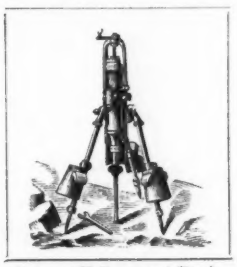

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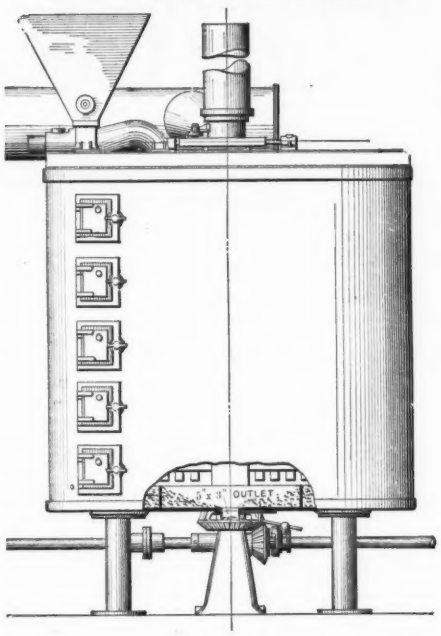

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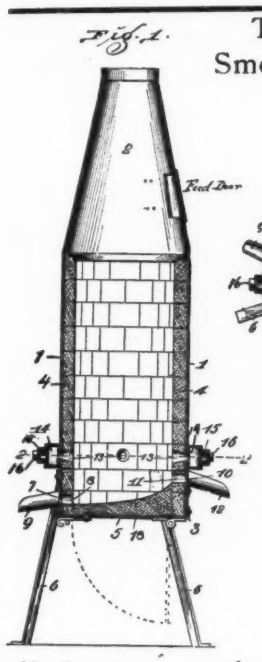

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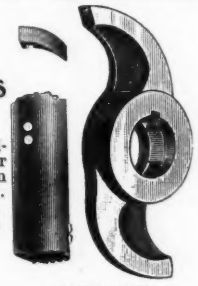

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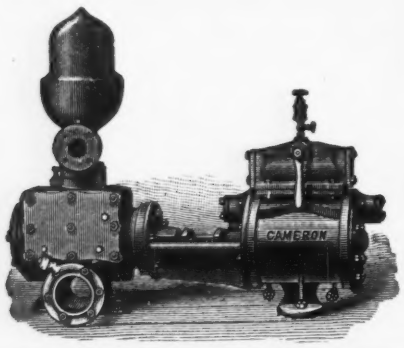

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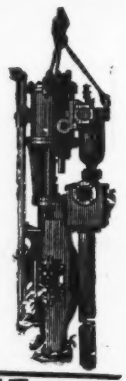

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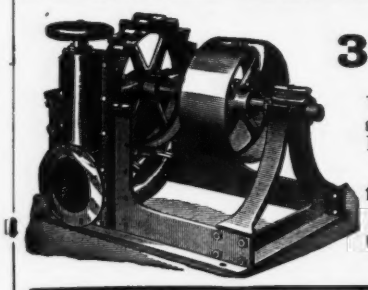

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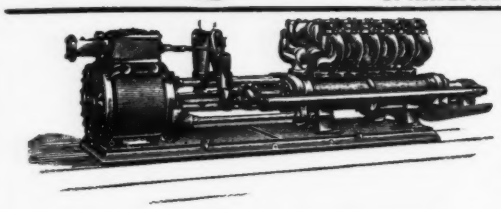

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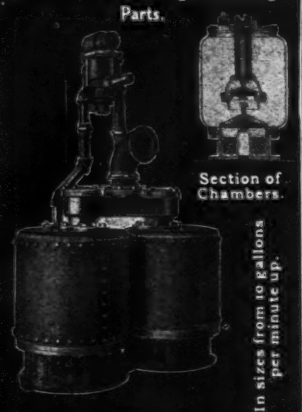

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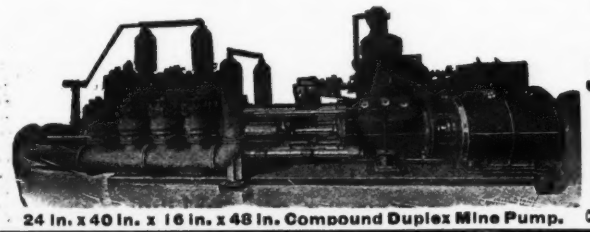

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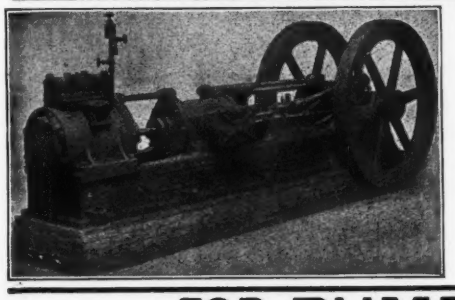

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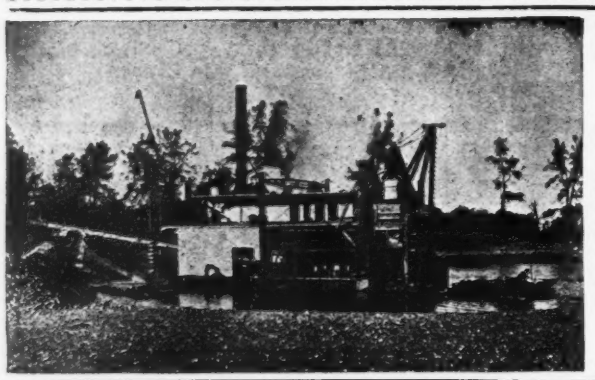

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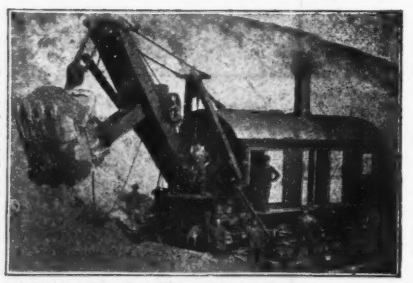

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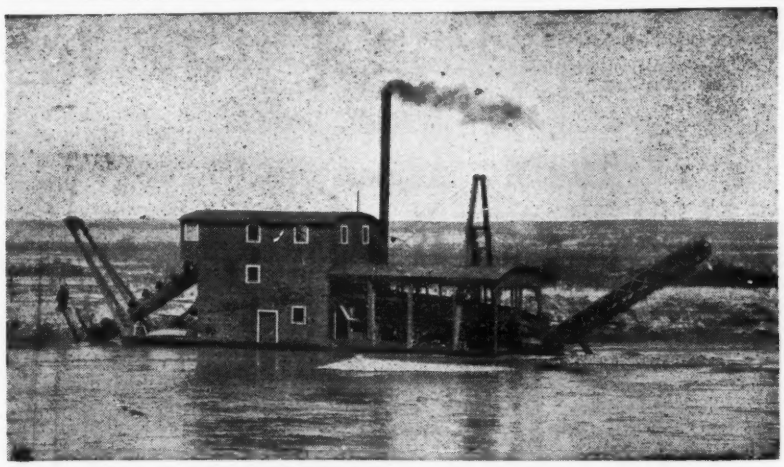

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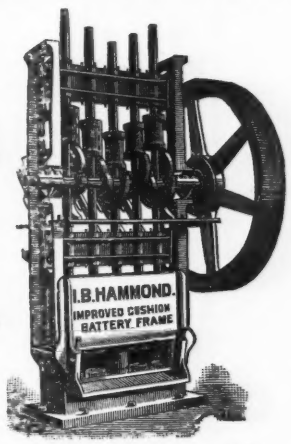

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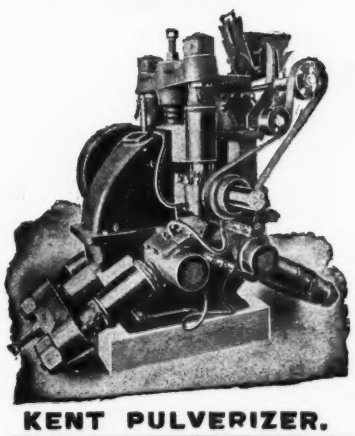

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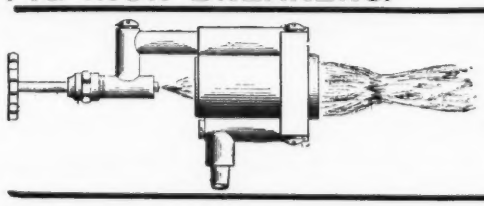

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Especially adapted for Contractors, Quarries, Shovels, Railroad Construction, Dredges, Bridge and Dock Builders, Water-Works, Brick Yards and Coal Docks.

Unaffected by Weather.

400 Railroads and over 500 Contractors now use the WELLS LIGHT.

Wells Light Mfg. Co.,

EDWARD ROBINSON, Sole Proprietor,

Send for Circular. 44 Washington St., New York.

THE RUNDLE POWDER THAWER

is in general use on many of the best kn wn mines in the United States. Have you ever used one?

By an investment of $5.00 you may avoid a frightful loss of life and its accompanying loss of property.

We have about four dozen of RUNDLE'S POWDER THAWERS in use in the Silver Lake Mines and we have found them entirely satisfactory.
EDWARD G. STOIBER,
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This is what the owner of one of Colorado's most famous group of mines says of this device. Write us for further information

No. 28

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THE HENDRIE & BOLTHOFF MFG. & SUPPLY CO., DENVER, COLO., U. S. A.

THE WM. HAMILTON MFG. CO., LIMITED,

. . . . . MANUFACTURERS OF . . . . .

Rock Crushers, Stamp Mills, Crushing Rolls,

Concentrating Machines, Hoisting Engines, Boilers, Etc.

BRANCH OFFICE, VANCOUVER, B. C. PETERBOROUGH, ONTARIO, CANADA.

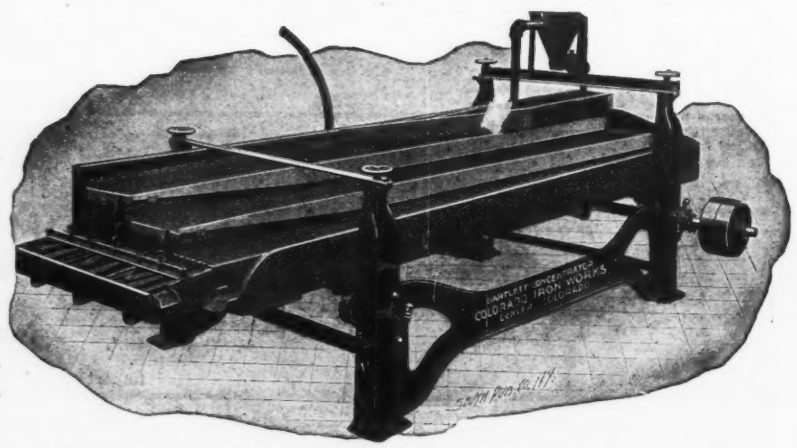
THE BARTLETT CONCENTRATOR.

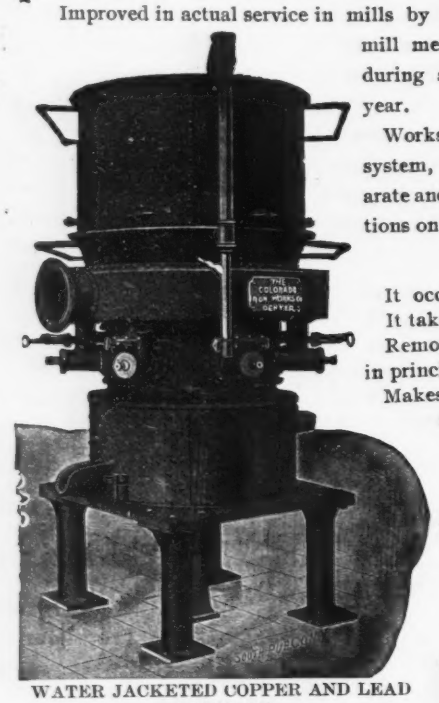
Solid Iron Top.

Only Three Wearing Parts. Impossible to Wear Out.

THE latest and most scientific Concentrator in the market. Improved in actual service in mills by the most practical mill men in the country during a test of over one year.

Works on the divided system, making three separate and distinct concentrations on the same machine.





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NOTE THE FOLLOWING POINTS OF SUPERIORITY:

It occupies a space of only 4 by 12 feet in the mill, and handles from 10 to 30 tons of ore daily.

It takes unsized material from 4 mesh down to slimes. Does its own sizing.

Removes the fine material first, on the upper shelf, using the least water there, which is scientifically correct in principle. Returns the pulp to the head of the next succeeding shelf for further concentration.

Makes three grades of concentrates on each shelf, and saves each by itself. Separates zinc from galena as no other machine can possibly do.

It takes the place of jigs, slime tables, hydraulic classifiers and all complicated machinery.

Renders the art of concentration so simple and cheap that small mines can afford to put in the system.

The table system of concentration is displacing all other systems, and has caused a revolution in the art of dressing ores within the short space of two years, marking an era in the history of mining.

Send for pamphlets containing special information.

Price of the 12-foot wood top table, - - $350.00.
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THE MINE AND SMELTER SUPPLY COMPANY

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We are the **Sole Agents** for the **WILFLEY CONCENTRATOR.** It is in use to-day in every part of the globe. You will find them in the gold diggings of Cape Horn, in Equatorial Africa, and beyond the Arctic Circle.

Took FIRST PRIZE and Gold Medal at the Auckland, New Zealand, Exposition last month over Vanners and Union Concentrators.

Will handle several times more material than any belt Concentrator made—bar none.

It will save more concentrates in proportion while so doing, and will catch any float gold, amalgam or quicksilver which may escape from the mortars or plates.

It will reduce smelting and transportation charges by making cleaner and more valuable concentrates than any other table.

It takes up less room and needs less power in proportion to work done—more money saved.

No expert is required to adjust or run the machine; its construction is simple and it is easily kept in repair.

It has no expensive belts to crack and wear out.

No belt machine will treat all kinds of materials. The Wilfley will. *It is the only sensible plan of concentration.*

These Tables have displaced belt tables of almost every make, as shown by letters in our possession.

PRICE, $450.

NOTICE.—We claim that the Cammett Concentrator which is being advertised and offered for sale, infringes upon claims covered and protected by U. S. Letters Patent No. 590,675, granted A. R. Wilfley for the Wilfley Concentrator, and that it is our purpose to institute legal proceedings against all persons who vend or put the same in use.

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WE CARRY THE LARGEST STOCK OF MINING AND MILLING MACHINERY AND SUPPLIES IN THE UNITED STATES.

Our stock of exclusive specialties is large and complete. Our connections with the best machine shop and foundry equipment in the West enable us to execute orders promptly and efficiently, and at the lowest market prices. We have exceptional facilities for fitting up complete: Concentrating Mills, Stamp Mills, Chlorination Mills, Cyanide Mills, Pan Amalgamation Mills, Sampling Mills, Hoisting Plants, Steam, Gasoline and Electric; Air Compressing and Drilling Plants; Power Plants, Steam, Gasoline and Water; Pumping Plants, Wire Rope Tramways, Placer Mining Plants. **Write for Catalogues and Prices before purchasing.**

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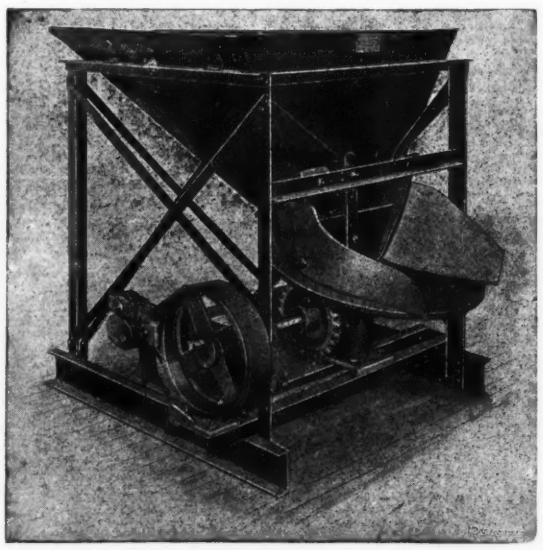
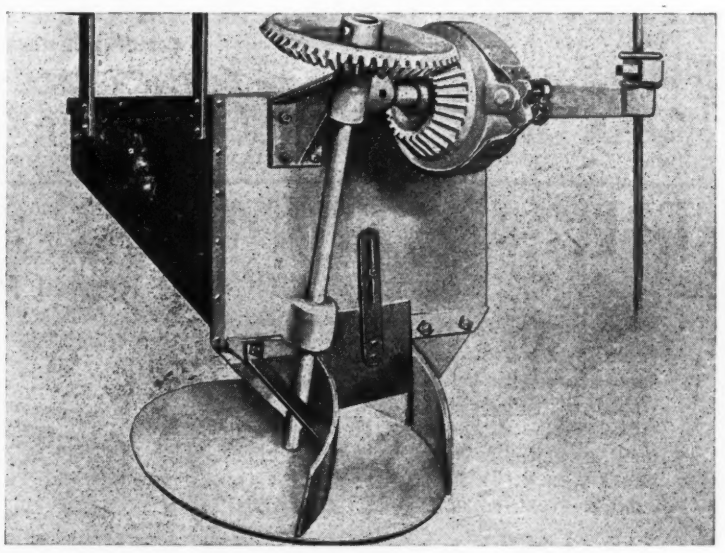
Manufacturers of High-Grade Mining and Ore Milling Machinery and Appliances.



Standard Type Belt and Stamp Driven.



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AUTOMATIC ORE FEEDERS.

In our Automatic ore feeders we use the well known inclined revolving feed plate operated by an extremely simple friction clutch driving mechanism which never fails to operate. We have discarded the usual weak wood frame and use a substantial steel frame, much superior in every way. Our suspended type of feeder is designed to be supported by timbers running from the battery frame to the ore bin, leaving a clear passageway and allowing free access to the rear of the motor.

Price Standard Type Belt Driven Feeder - - -	$100.00
" " " Stamp " " - - -	90.00
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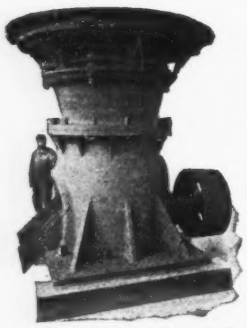

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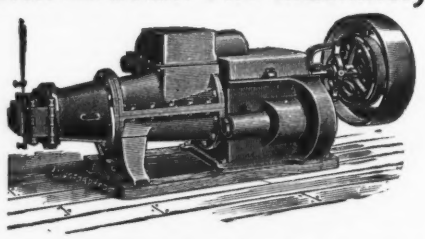

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BUILDERS OF THE **ONLY SUCCESSFUL PLANT** FOR THE

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PARTICULARS FURNISHED ON APPLICATION.

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Designed with some Regard for the Laws of Concentration

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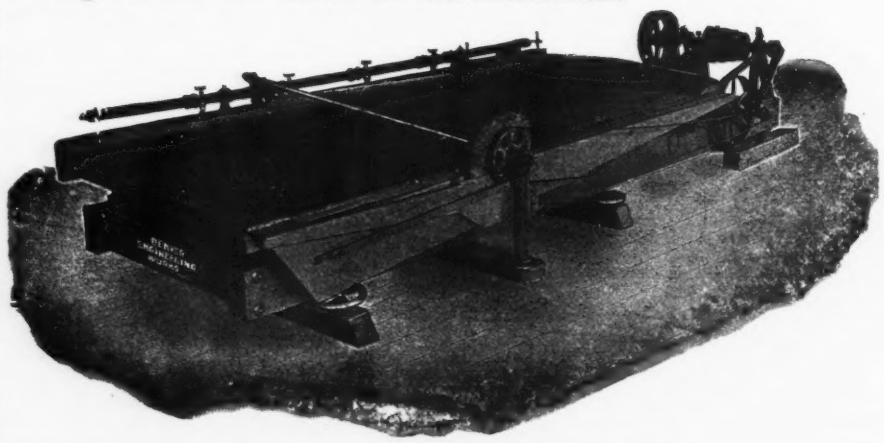
The continuous grooves and riffles extending from end to end of the table maintains the greatest possible margin of safety between the concentrates discharge and the tailings.



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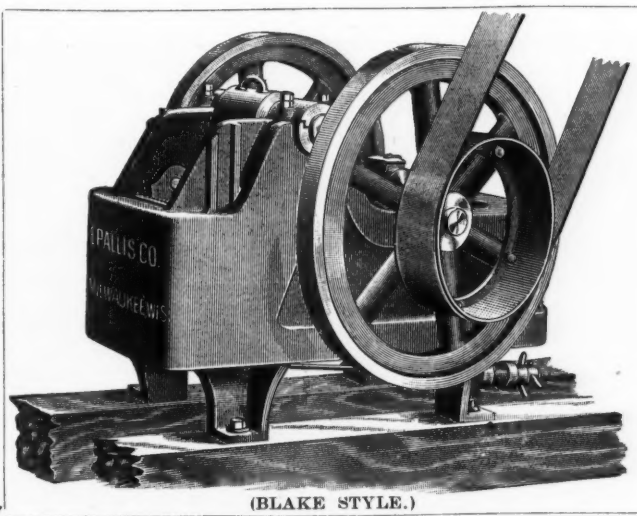

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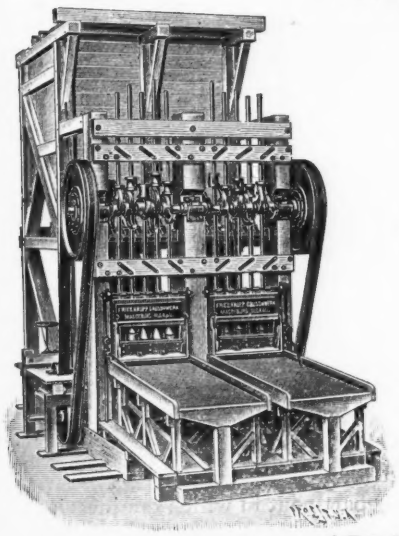

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Ore Crushing:
Stone Breakers of especially strong construction.
Roller Mills, Chilian Mills, Ball Mills,
for dry and wet crushing. About 2,000 at work.
Stamp Batteries.
Shoes and Dies of Krupp's Special Steel.

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Amalgamation Tables and Pans, László's Gold Amalgamators, Settlers, etc.

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Separators, Exhaustors, Hydraulic Classifiers, Percussion Tables, Jiggers, Rotating Round Tables.

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Complete Gold Ore Dressing Plant.

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Large Testing Station for Crushing and Dressing Ores at the Works.

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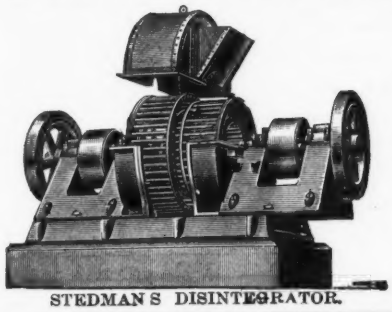
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Disintegrators and Pulverizers
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We have positively the best and most satisfactory mill on the market. This machine is a perfect success for breaking up or pulverizing GOLD and SILVER SLIMES.

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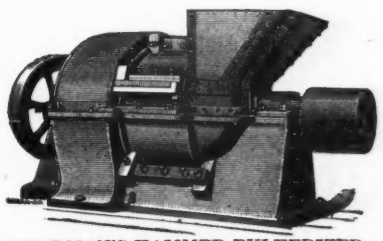
STEDMAN'S HAMMER PULVERIZER.

FRASER & CHALMERS,

CHICAGO, ILL., U. S. A. LONDON, ENG.

We continue the presentation of views of our Chicago shops with a partial interior of our FOUNDRY, giving some idea of the size and character of our castings. Fraser & Chalmers' shops are strong in all departments.

The Blacksmith and Boiler Making Shops produce many heavy and special constructions in which powerful flanging and pressing machinery is employed. Massive converters and steel plate ladles and seamless welded steel and copper water jackets for metallurgical plant are examples.

The Machine Shops (of which more will be said) are equipped with large tools of recent designs capable of exact and expeditious work,

The Perforated Metals Shop is a model of its kind turning out a high-grade product.

But the FOUNDRY is especially noteworthy. This more than any other is the department in which engineering designs take shape. It is of large area, planned for the greatest convenience in handling all the materials which go to make the finished casting. It has two very powerful electric-driven bridge cranes supplemented by steam hydraulic, air lift and other cranes. The core ovens are large. The skillful making and use of cores is notable in this foundry.

The Cupolas used for different qualities of iron ensure uniformity. Large bronze castings of many tons weight are also made, being required for the bodies of mine pumps lifting acidulous water. This foundry produces work in which others have not succeeded as well. This excellence is due both to skill in moulding and experience in determining quality of metal. Some machine forms such as the tripods of gyratory crushers demand the strongest iron that can be produced, and it is wise to purchase of those whose large experience assures the customer that his machine will be practically unbreakable.

While we are giving this glimpse of our shop facilities, we ask customers to remember what we make, viz.:

Stamp Batteries,
Comet, Blake and Dodge Rock Crushers,
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THE FARREL { Blake Pattern CRUSHER

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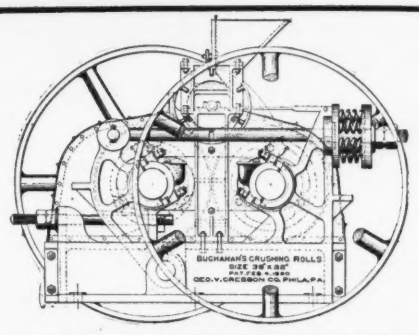

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MAGNETIC SEPARATORS

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Write the ENGINEERING AND MINING JOURNAL. It will help you.

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Manufacturers of High Grade Portland Cement.

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Gentlemen:—Replying to yours of the 14th inst. inquiring as to the satisfaction your Griffin Mills are giving us, would say that our Company, having recently decided to build a new plant, we have been looking closely into the working and operating other kinds of mills for pulverizing cement clinker and lime rock, and have concluded, after thorough examination, that we will equip our new works with 28 Griffin Mills. This, in addition to our present plant, will give us 52 of your mills in use. This should be sufficient evidence that we are well pleased with the Griffin Mills.

Yours truly,

(Signed) CHAS. A. MATCHAM, Superintendent.

We will be pleased to furnish intending buyers with full information regarding the working qualities of these Mills for pulverizing all varieties of refractory substances.

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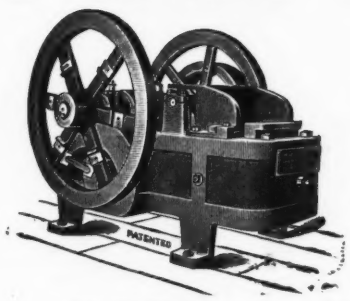

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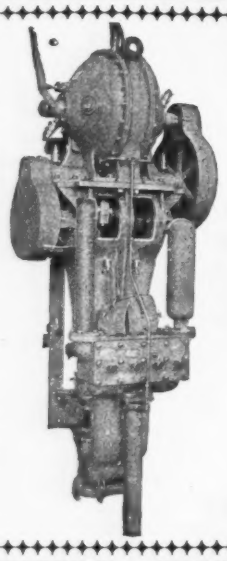

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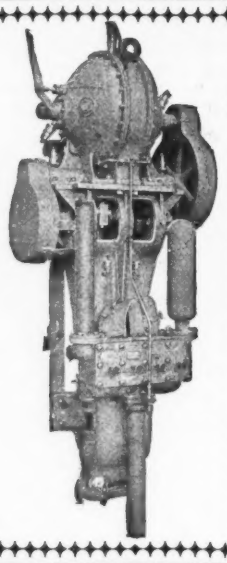

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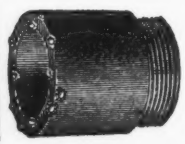

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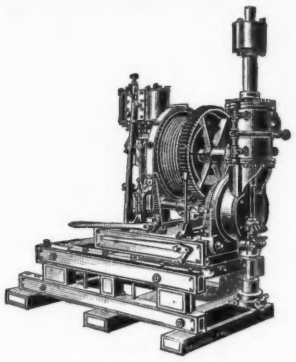

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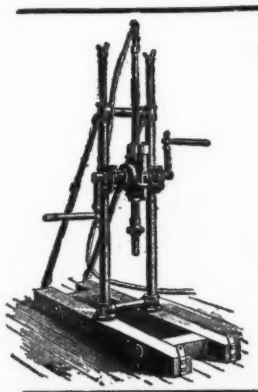

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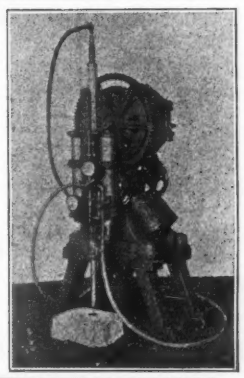

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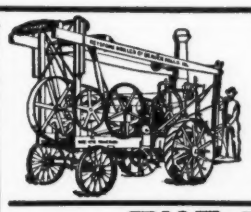

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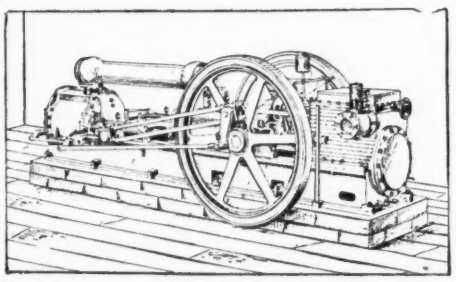

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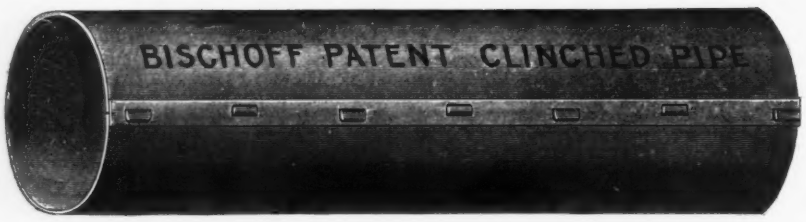

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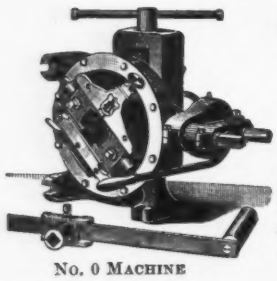

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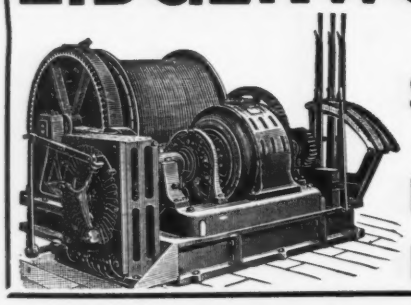

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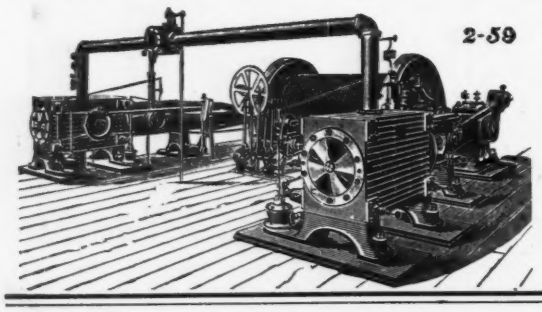

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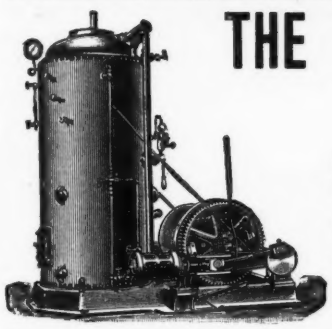

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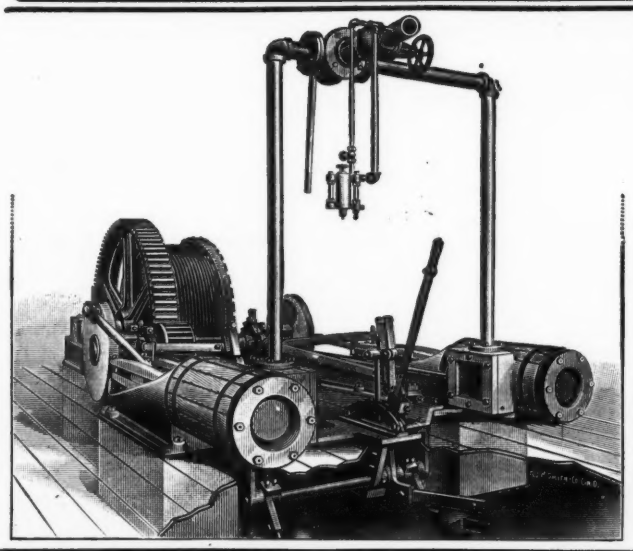

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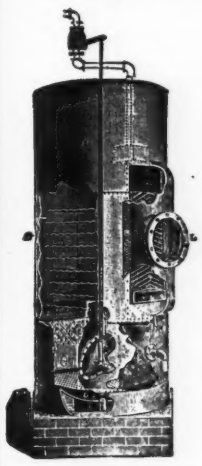

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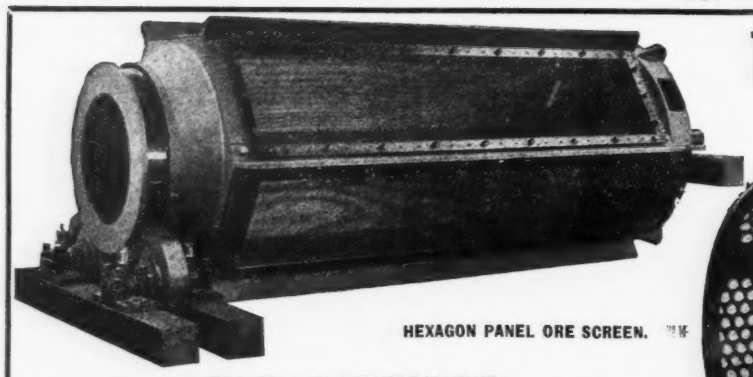

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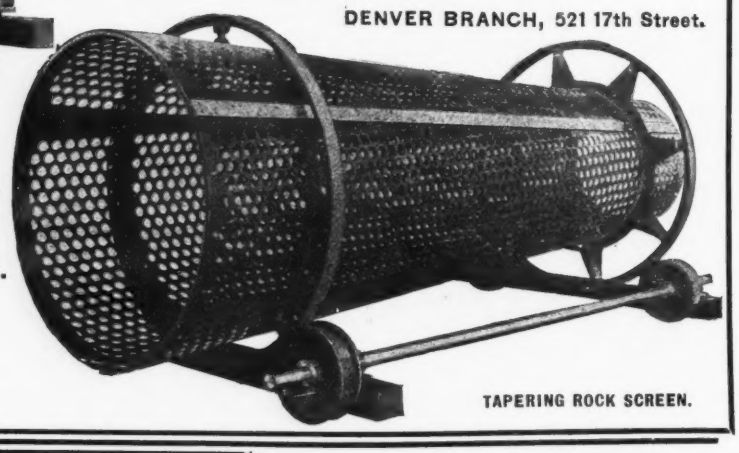

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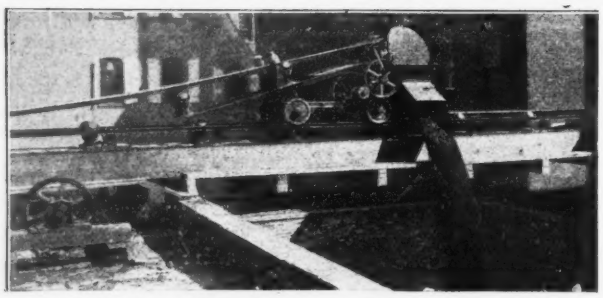

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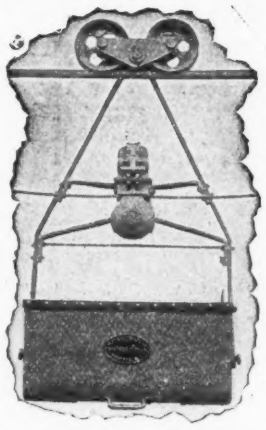

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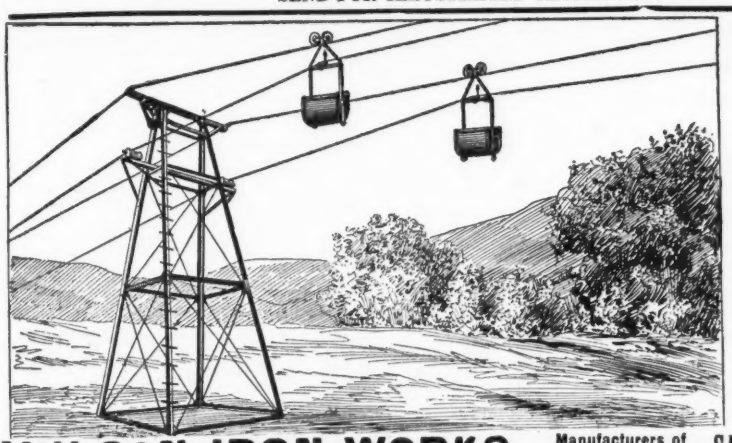

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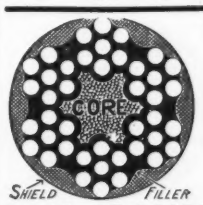

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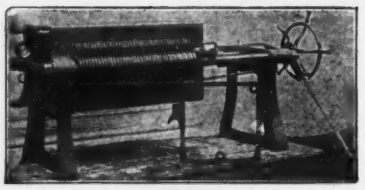
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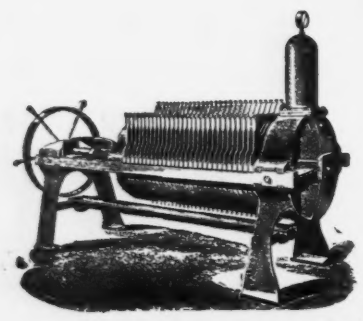

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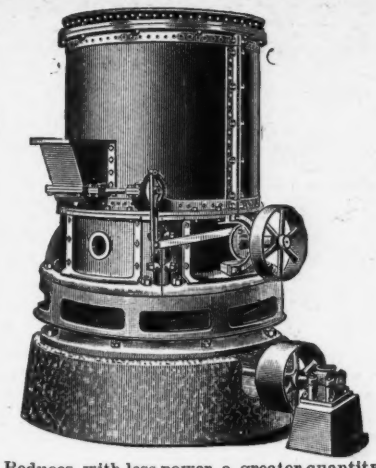

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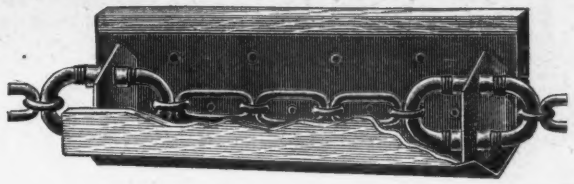

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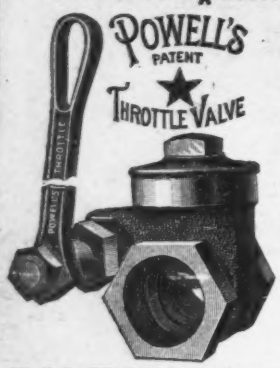

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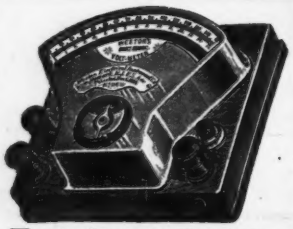

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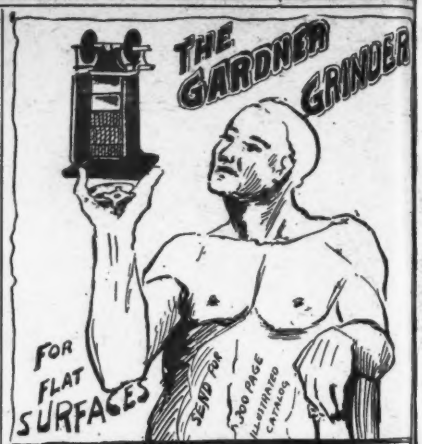

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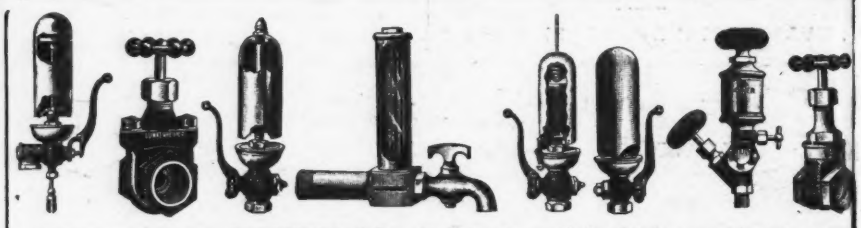

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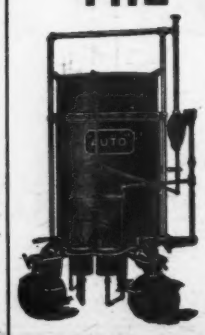

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